

ANIMAL KEEPERS' FORUM

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**The Journal of the American
Association of Zoo Keepers, Inc.**

JANUARY 1996

ANIMAL KEEPERS' FORUM, 635 S.W. Gage Blvd., Topeka, KS 66606-2066
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Diet Notebook, Mammals, Vol. II

Susan Bunn Spencer, Rockford, MI

Incubation Notebook Project

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About the Cover.....

This month's cover features the Black Howler Monkey (Alouatta caraya) drawn by Joan Watson who works in the Graphics Dept. at the Metro Toronto Zoo. These Amazon-dwelling primates are perhaps best known for their distinctive howling which serves as communication between members of the troop. The howlers make a series of sounds: harsh howling, barking, clucking, groaning and moaning and each cry means something different such as danger, a lost baby, a wounded comrade, a food find, etc. The howl of the troop each morning also signals territorial boundaries to other troops in the area. Thanks, Joan!

Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm]) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

Deadline for each regular issue is the 10th of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the editor.

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

Scoops & Scuttlebutt



Update from the Research Grants Committee

Each year AAZK has awarded grants for Zoo Keeper-initiated research. Due to the Association's tax-emempt status and the resignation of the committee chairperson, the Board of Directors of AAZK, Inc. has decided not to award research grants in 1996. This will give the Board an opportunity to reevaluate the reporting and administrative processes for these grants. The Board of Directors anticipates awarding two \$750.00 research grants in 1997. Any questions about these grants should be directed to Board Member Alan Baker at (315) 435-8512.

Please Note New Address for Inspections Manual Chair

Rachél Watkins Rogers, Chair of the AAZK Inspection Standards Project has recently made a career move from San Diego, CA to El Paso, TX, where she has taken on the position of Area Supervisor. Anyone needing to reach Rachél on matters dealing with the Inspection Standards Manual Project may do so by writing her at the El Paso Zoo, 4002 E. Paisano Dr., El Paso, TX 79905-4223; phone (915) 521-1850; Fax (915) 521-1857.

A Well-Deserved Thank You

The staff of *Animal Keepers' Forum* would like to thank Pam Talbot, a volunteer at the Woodland Park Zoological Gardens in Seattle, WA, for again compiling the annual index for the journal. This is a monumental task and we sincerely appreciate Pam's efforts with this important project. Her willingness to index the *AKF* frees up our time for other aspects of the publication.

Chapter Reminder - Recharter Packets

Chapter Recharter Packets were mailed out the first week in January and are due back to Administrative Offices **no later than 1 March 1996**. A \$50.00 late fee (in addition to recharter fee) will be assessed for those returned after this deadline. If you need assistance with filling out the recharter forms, contact Barbara Manspeaker at Administrative Offices in Topeka, KS.

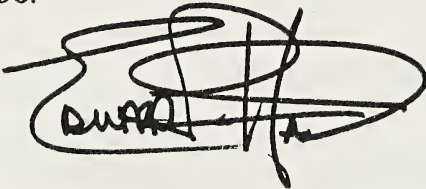
**Want to win a free trip to the 1997 Houston Conference?
SEE INSERT IN THIS ISSUE !**

From the Executive Director...

Having been a member of this Association for the past 17 years, I have watched us grow from a very small group of zoo keepers, interested in aspects of animal husbandry, into a dedicated membership, focused on both captive animal welfare and global ecological conservation.

As a member of AAZK, you have expanded your professional goals to include conservation projects on five continents. Simply stated, it is zoo keepers making a difference. However, the administration of these projects is complicated and certainly costly. To keep the membership dues affordable for continuing zoo professionals and potential new members, I urge you to undertake the challenge of membership recruitment in your zoo.

In an effort to expand the professionalism associated with AAZK Conferences, the time has come to once again take the next evolutionary step. The Board of Directors has voted to establish the position of **National Program Chair** for the Annual Conference. The individual in this position will serve as a representative from the Board and will assist and advise the Host Program Committee in selecting papers, and posters; and in planning and organizing workshops. If you are interested in applying for the position of Program Chair, or would care to nominate an individual, please submit a resumé and references to me c/o the Administrative Offices. The Board of Directors will review the resumé and select the most qualified individual. Please respond **by 1 March 1996**.

A handwritten signature in black ink, appearing to read 'Ed Hansen', with a large, stylized flourish extending from the end of the signature.

Ed Hansen, Executive Director
AAZK, Inc.

AAZK Award Nominations Are Now Being Accepted for 1996!

The AAZK Awards Committee is accepting nominations for the **Certificate of Excellence in Exhibit Renovation (CEER)** to be presented at the 1996 AAZK Conference in Detroit, MI. The deadline for all award nominations is **1 June 1996**. Information concerning the qualifications, nomination procedure, selection procedure and an explanation of the awards may be obtained by contacting Janet McCoy, Chair, AAZK Awards Committee, Washington Park Zoo, 4001 S.W. Canyon Rd., Portland, OR 97221.

CERTIFICATE OF EXCELLENCE IN EXHIBIT RENOVATION (CEER)

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Certificate of Excellence in Exhibit Renovation (CEER) presented by the AAZK Awards Committee. The purpose of the award is to recognize institutions or organizations in the zoological community for the design and renovation of existing animal facilities which involved active keeper participation in the process.

The character of the award includes; a certificate, letter of notification to the institution's director and national recognition by professional journals. Such journals include: the American Zoo and Aquarium Association (AZA) and the Canadian Association of Zoological Parks and Aquarium (CAZPA) Newsletters, Animal Keepers' Forum (AAZK), Awards, Honors and Prizes; Volume 1; United States and Canada. The latter is published by Gale Research Company based in Wheaton, MD and found in medium to large sized libraries across the U.S. and Canada.

The CEER was established by Janet McCoy, 1990 CHAIR. Bill Whittaker proposed the award to the AAZK Board of Directors. The award is presented at the annual AAZK National Conference.

Qualifications:

1. Any North American zoological institution or organization is eligible.
2. The renovated exhibit must be in full operation for at least two years.
3. The exhibit must be nominated by a keeper at that same institution or organization. Supporting nominations may be submitted by management personnel from the same institution.

Nomination Procedure:

1. List institution or organization's name, address, phone and Director.
2. **Document** local awards or commendations for exhibit, drawings, 8 X 10 color photos - no slides (2 before and 8 after), and renovated exhibit type: single or multispecies, and size.
3. **Document** keeper participation in the design and why the existing facility was renovated.
4. **Document** interface with other zoo divisions; and maintenance of exhibit after completion.
5. The deadline for nominations is **JUNE 1st** of each year.

NOTE: Materials will not be returned, but forwarded to the Exhibit Design Committee.

Selection Procedure:

The Awards Committee, consisting of 5 keepers, will independently review each nominee.

Nominee Evaluation:

The evaluation of each nomination is broken down into four categories based on the general guidelines outlined for the award. The four categories are: Keeper Involvement, Exhibit Functionality, Exhibit Management and Visitor Point of View/ Other Information. Items the committee is looking for are the following:

A. KEEPER INVOLVEMENT:

- a) degree of keeper involvement with conceptual development of exhibit
- b) degree of keeper involvement with facilitation of completion of exhibit, (fund raising, promotion, assist with construction)
- c) contribution to educational experience (graphics, conservation message)
- d) originality - is it something new and different, or has it been tried before

B. EXHIBIT FUNCTIONALITY:

- a) versatility - indoor/outdoor, four seasons, protection from elements
- b) accommodates and encourages animal's natural behavior - climbing structures, land area, height, water
- c) hard (gunite, concrete) vs soft (grass, dirt) environments - as to animal needs
- d) sight lines valuable to animal as well as visitor - important to some animals (polar bear, chimps)

- e) physical and visual barriers for animal's use, animal safety
- f) flexible entrance/exits (hoofstock - more than one entrance)
- g) ability to exhibit natural social grouping
- h) breeding success

C. EXHIBIT MANAGEMENT:

- a) how management of exhibit interfaces with other zoo divisions (grounds, maintenance - simple repair, paint)
- b) keeper serviceability, overall maintenance of exhibit and surroundings
- c) adequate drains and properly located
- d) quality and versatility of holding areas - ease of separating animals, moving, breeding, sick
- e) keeper sight lines - can you see animal when they come into holding or when shifting them between areas, keeper safety
- f) ease of providing time change items (browse, logs, feed, novel objects)
- g) environmental control (ease of seasonal adjustments - ventilation, heat)

D. VISITOR POINT OF VIEW/OTHER INFORMATION:

- a) educational experience (conservation message)
- b) immediate and sustained viewer interest
- c) sight lines - not see doors, drains, fencing - does it have esthetics
- d) bonus point - local awards, commendation, "wow" factor
- e) include anything else pertinent to the renovated exhibit that you think is important

Please Note New AKF Deadline

**Beginning in 1996 the monthly deadline for
Animal Keepers' Forum
will be the 10th of each month**

State of the Association Report

Greetings from the Lone Star State!

The year 1995 can be looked at as a chrysalis — a stage in the process of metamorphosis before the pupa breaks out as a butterfly. Changes have occurred within the membership services and with products to better fit the needs of the Association.

The most prevalent metamorphosis has been with the *Animal Keepers' Forum*. The new size and format will offer an opportunity to generate advertising revenue to offset production costs. Corporate advertisers are essential in keeping membership affordable while producing a professional journal. A marketing resources chairperson has been appointed to target potential advertisers and follow-up prospective leads.

Generous contributions from Chapters and individuals have offered AAZK the opportunity to produce many materials which each of us use everyday. The Operations Manual has been completed and distributed to Regional Coordinators and Chapters. Manuals also have been produced to assist committee chairs with the duties of their positions. A 1995 printing of the Animal Data Transfer Forms was underwritten by a generous contribution of the Columbus Zoo. The ADT Form has been a very successful project and the forms are used worldwide.

The Liaison and Information Network for Keepers (L.I.N.K.) has made changes in the *LINK BULLETIN* to offer Chapters more information within a different format. This is your opportunity as Chapter members to obtain information that is generally not available in the *AKF*. There are currently 71 AAZK Chapters. The most recent to join the ranks was the Greater Austin Chapter (Austin, TX) which was approved for charter by the Board at the Denver Conference.

Our constant dedication to and support of conservation projects continue to pass milestones. Since 1990, Bowling for Rhinos has raised more than \$670,000.00 for the Lewa Wildlife Conservancy (formerly Ngare Sergoi Rhino Sanctuary) in Kenya and the Ujong Kulan National Park in Java, Indonesia. In 1995, over 50 AAZK Chapters and other participating institutions raised in excess of \$120,000.00. The first \$100,000.00 each year will continue to be sent to LWC. Any funds above and beyond \$100,000.00 will be sent to Ujong Kulan through the "Adopt A Park" program.


The Center for Ecosystem Survival (Ecosystem Survival Plan) continues to receive generous support from AAZK chapters throughout the country. This summer CES, through its rainforest Conservation parking meters and companion Adopt-an-Acre program, has raised more than \$1 million since 1988.

The Fall of 1995 brought the unveiling of the Marine Conservation parking meter, an initiative to protect endangered coral reef habitats in three marine conservation sites in Micronesia, Indonesia, and the Dominican Republic.

As professionals we continue to grow. Today's zoo keeper is looking for more to nurture one's professional development. The Board of Directors has made a pledge to offer programs or workshops at National Conferences which will promote the professional development of the membership. Development and growth, however, come at a price. This is where you as members can help. The focus of 1996 is to increase AAZK memberships. Memberships have barely seen an increase in over three years. As the Association enters the stage of the butterfly, to fulfill our metamorphosis, each of us should take an individual pledge to encourage colleagues to join AAZK. With your help we can continue to offer quality products and services at home while contributing to the conservation efforts around the world.

Remember, this is your Association. What you do as an individual can make a difference. AAZK is committed to raising the standards of quality animal care in all aspects of the profession. We have a commitment to conservation and education, while continuing to provide the latest information on husbandry and enrichment available to the membership.

Respectively,



Ric Urban, President, AAZK, Inc.
Houston Zoological Gardens
Houston, TX



Information Please

We would like any information regarding otters using slides (or not) in captivity. We have North American river otter (*Lutra canadensis*), but information on other otters is also of interest. Please give dimensions of slide, including length, width and approximate grade for steepness. Also, please include relative use and your thoughts on motivation for use. Please send to: Michelle Acuña, Arizona-Sonora Desert Museum, 2021 North Kinney Rd., Tucson, AZ 85743; (520) 883-1380, Ext. 187; Fax (520) 883-2500.

We are seeking dietary (supplemental) information for chilean flamingos (*Phoenicopterus ruber chilensis*). We feed only prepared flamingo fare at present. We would also like dietary information for grey wolves (*Canis lupus*) and coyotes (*Canis latrans*), to conduct a comparative study. Please send to: Animal Department, Six Flags California, P.O. Box 5500, Valencia, CA 91385.

Seeking information from any person or institution with experience in attempting successfully or otherwise, the introduction and placement of 1.1 adult mountain lions (*Panthera concolor*) together on exhibit. We would like to know: the age of the mountain lions, where the introduction took place, i.e. in holding, off-exhibit; what season of the year; when cats were actually placed together, both in holding and on exhibit; the occurrence of any encounters, whether positive or negative, and their frequency; behavior changes before and after placing them together; any psychological effects; any changes in appetite; whether cats were spayed or neutered; a description of the exhibit area or holding, including size, for introduction and/or placing together. Please contact: Jackie Misuraca, The Living Desert, 47-900 Portola Ave., Plam Desert, CA 92260. Phone (619) 346-5694; Fax (619) 568-9685.

During 1996, the Bermuda Aquarium, Museum and Zoo will be acquiring numerous new animal species for its collection. Animal included will be: green tree monitor (*Varanus prasinus*), black tree monitor (*Varanus beccari*), water dragon (*Physignathus cocincinus*), carpet python (*Python spilotes variegatus*).

We would appreciate any information on 1) dietary requirements, e.g. types of natural and processed foods available plus recommended manufacturers; 2) diseases applicable to these animals, e.g. viral, parasitic plus treatments; 3) housing in relation to other species, i.e. small birds and mammals; 4) recommended durable foilage; and 5) enrichment devices.

Please send information to Robin Msarirea. c/o The Bermuda Aquariums, Museum and Zoo, P.O. Box FL 145, Flatts, Smith's FL BX, Bermuda. Phone (441) 293-2727, ext. 20; Fax (441) 293-7136.

Seeking information regarding environmental enrichment in Japanese macaque (*Macaca fuscata*) exhibits. Looking for proven techniques "basic to creative" to blend in with naturalized exhibit. Please send information or suggestions to: Capron Park Zoo, Education Department, 201 County Street, Attleboro, MA 02703.



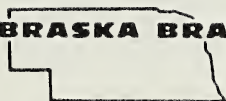
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The Death of Samia and Samuel.....

We are sorry to report that Samia, the black rhino handraised by Anna Merz, and her calf, Samuel died on Wednesday, 23 November 1995. The ten-year-old rhino and her seven-month old son died from injuries sustained after being chased over a 40-foot cliff by a male rhino at Lewa Wildlife Conservancy (formerly Ngare Seroi Rhino Sanctuary). AAZK supplies partial funding for the Conservancy through its annual "Bowling for Rhinos" fundraiser.

Samia was born to Solio on 15 February 1985 and promptly deserted by her mother who had no milk. Anna Merz began raising Samia when she was only three days old and at the age of three and a half years, Anna weaned her and Samia began to lead the life of a normal wild rhino, integrating without problems with the other rhinos living in the area. Anna gathered an extraordinary amount of valuable new information about rhino behavior during this process and this information has been valuable to researchers both in the wild and in captive situations.

In 1994 Samia was bred by Kenu several times and on the 11 of April 1995 gave birth to a male calf, Samuel. She proved to be an affectionate and protective mother to him. His birth presented a unique and unprecedented opportunity to closely witness the maternal behavior of a rhino raised with substantial human influence. Anna's painstaking efforts to help Samia adapt to life in the wild proved successful and this special rhino provided a model for examination of many of the behaviors which might be anticipated if a captive-bred rhino were released in the wild. It was hoped that Samuel would also adjust and adapt naturally, completing the circle and the dream of returning captive-bred rhinos back to the wild in protected habitat situations. The experiences at Lewa prove that this concept can be a reality.

Visitors to Lewa were frequently awakened by the squeaks of Samuel as he would follow Samia through the tall grass just outside Anna's guest house. Samia bedded down each night close to the safety of Anna's house, but as soon as she woke and showed off her calf to Anna, she wandered into the bush to become just like the other rhinos — wild but protected in the safe haven of Lewa.

However, all the efforts of the folks at Lewa couldn't save these rhinos from a natural death. When Samia began to cycle once again, it attracted an aggressive male to the area. He chased Samia over the cliff and Samuel, who never left his mother's side, followed. If there can be any consolation in this loss, it is that Samia and Samuel did not die at the hands of poachers, but in an accident that could have happened in any group of rhinos.

A documentary film has recently been completed on Samia and her calf and it was Anna's hope that Samia would thus act as an ambassador for her species - galvanizing we humans into action to prevent their extinction. Samia and

Samuel will indeed continue to serve as ambassadors for their species—their remarkable story will hopefully continue to move people to the plight of the rhino and encourage their participation in efforts to preserve it. In 1996 we will bowl in memory of Samia and Samuel - their deaths do not signal the end of our commitment to their species or the Lewa Wildlife Conservancy.

As you can imagine, Anna, who spent seven years of her life teaching Samia all she could to be able to survive as a wild rhino, is devastated by this tragic loss. Although Anna knows that they died of natural causes and an incredible amount of knowledge was gained from Samia and Samuel, she can use everyone's support to help her through this time. Please write Anna Merz, Lewa Downs, Ltd., Private Bag, Isiolo, Kenya.

Andy Lodge, Director of the Ngare Sergoi Support Group, Inc., wishes to thank all those keepers who have contacted him with expressions of sympathy and support following this loss. Their concern is very much appreciated.

>Information for this article was provided by Andy Lodge, Director of the Ngare Sergoi Support Group, Inc., the staff at Lewa Wildlife Conservancy, and Patty Pearthree, Coordinator of AAZK's "Bowling for Rhinos".



Samia and Anna

AAZK Logo T-Shirts and Sweatshirts —

New Sizes and Colors Available

The AAZK Rhino Logo is imprinted on the left front pocket area of each shirt. T-Shirts and Sweatshirts are available in Large, X-Large and XX-Large. Prices including postage are: \$10.00 for T-Shirts and \$20.00 for Sweatshirts.

T-Shirts are available in Tan, Maroon, Forest Green and Navy.

Sweatshirts are available in Gray, Forest Green and Navy.

To order, complete information below, make checks or money orders payable to "Little Rock AAZK" and send to: Britt Thompson, Little Rock Zoo, #1 Jonesboro Drive, Little Rock, AR 72205. Also, please note that the Logo Colder Holders have been discontinued and are no longer available.

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Address: _____

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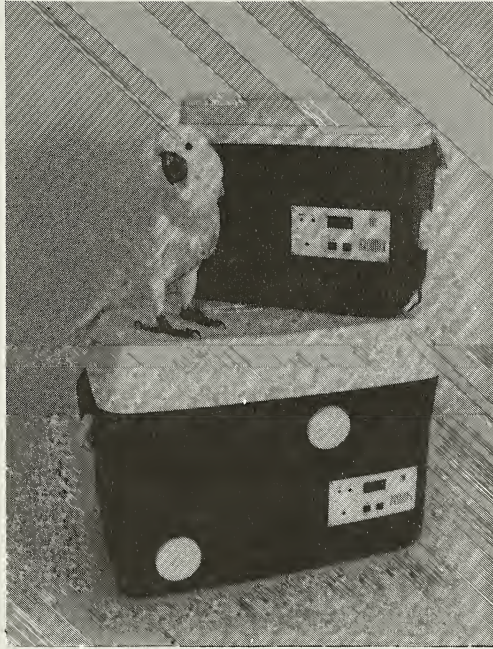
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The International Wildlife Scene

Compiled by Georgann Johnston
Legislative Advisor
Sacramento, CA



Black-Footed Ferrets to be Reintroduced to Arizona

The U.S. Fish and Wildlife Service and the Arizona Game and Fish Department have proposed a project to reintroduce black-footed ferrets (*Mustela nigripes*) into the Aubrey Valley area. The ferret is a federally listed endangered species and the plan is to implement a "primary recovery action" and evaluate release techniques.

The ferrets to be used in the project are surplus to the captive population and it is hoped that a wild population will establish itself within five years of the initial release date. Information concerning the release plan and the experimental population may be obtained from William Austin, Arizona Ecological Services Field Office, USFWS, 2321 West Royal Palm Road, Suite 103, Phoenix, AZ 85021, (602) 640-2720. A copy of the proposed rule regarding this project can also be found in the *Federal Register*, 15 November 1995.

Source: Federal Register, 15 November 1995, Vol. 60, No. 220

Roving Circus Charged With Marketing Endangered Species

The Akef Egyptian Circus has been traveling throughout Africa for the past five years, followed by a number of animal rights activists who say that the circus is really a front for a business engaged in smuggling endangered species. The Society for the Prevention of Cruelty to Animals in Zimbabwe was successful in drawing the government's attention to the circus and the Akef organization was run out of that country.

Investigators pointed out that the method of operation of the Akef caravan is unusual as far as a typical circus goes. For example, the circus arrived in Zimbabwe in May, gave a few performances in July and August, and did not leave until November. "They're obviously not making money as a circus," said Steve Thompson, Chairman of the Chimfunshi Wildlife Orphanage Trust, which has a chimpanzee refuge in Zambia. Mr. Thompson also pointed out that the route of the circus took it through Djubouti, Uganda, Tanzania, Zambia and Malawi. These are poor countries where few people could afford the price of an admission ticket, but they are rich in wildlife.

The circus left Egypt in 1990 with two chimpanzees and six have been seized enroute. In early 1995, the head of the Akef family showed bills of sale for baby chimpanzees bought from a known Zambian smuggler to a representative of the Zimbabwe SPCA. Further documentation showed that the circus arrived in Uganda with five pythons

but left with only two, then arrived in Kenya with seven. It then arrived in Zambia with six, left with two, and arrived in Zimbabwe with four. The number of lions in the circus has been as high as ten and as low as six; the number of endangered parrots have varied from nine to zero. The only consistent number on the circus' papers is for the four Siberian tigers, which cannot be found in Africa.

Spokespersons for the Zimbabwe SPCA said the circus is headed for South Africa at this point. Mr. Akef denied having any chimpanzees in his possession and objected to the expulsion from Zimbabwe on the basis of diplomatic immunity.

Source: New York Times, 29 November 1995

Arabian Leopard Faces Extinction

Hunting and land development projects have severely reduced the population of Arabian leopards in the Gulf, bringing it to the edge of extinction. In an attempt to reverse this trend, representatives from four Gulf states met in the United Arab Emirates to develop a regional wildlife conservation plan to protect this species.

The Arabian Leopard Trust (ALT), a new organization formed to investigate the situation and propose solutions, sponsored the two-day workshop which brought together wildlife experts from Oman, Saudi Arabia, Yemen, and the UAE — the only countries which still have leopards extant. Earlier this year, the ALT funded a scientific study about the animals of the UAE mountains. The study discovered evidence of the presence of the Blanford fox and the Arabian tahr, a goat-like animal that was believed to have become extinct. While a rare Caracal lynx was spotted during the study, there was no evidence of any Arabian leopards in the study area.

Because the leopard has little in the way of natural foods left to survive on, its easiest prey is domestic sheep and goats. The villagers who raise these animals kill the leopards to protect their livestock. Additionally, the animals are still trapped in the UAE and Oman and then sold in the exotic animal markets.

The Arabian Leopard Trust is privately funded but is seeking corporate sponsorship and governmental support for the initial development of a captive breeding center for the leopards.

Source: International Press Service, 31 October 1995.

Nepal Debates Sale of Endangered Animal Parts

A nature reserve in Nepal's southern plains is the home to a number of warehouses stacked high with rhino horns, tiger bones, animal fur, musk and other animal parts worth millions of dollars. These parts were confiscated from poachers and the Nepali government is currently debating the future of these items.

On the one hand, "selling the accumulated contraband would provide a massive one-time infusion of funds for conservation in Nepal, whose disbursement would be decided by local specialists themselves rather than under the direction of donor agencies," said one Nepali official. The alternative is to destroy the products on the

basis that CITES, to which Nepal is a signatory, prohibits any commercial trade in the animals from whom these parts were taken.

Time is of the essence since wildlife experts and government officials both report that the items are not being stored properly and the risk of damage or theft remains high. A governmental task force investigated the storage situation in early 1995 and reported that the condition of the stored materials is poor: hides are decomposing, furs are disintegrating, rhino horns are under attack from parasites.

The task force also wrote to the CITES Secretariat in Switzerland asking for guidelines on what to do with these parts and possible future caches. CITES has not responded. One possible solution has been posed by Shyam Bajimaya of the Department of National Parks and Wildlife and a member of the task force: "A better bargain would be sending some of our stocks to Western museums to be used for educational purposes in return for funds for our conservation projects which urgently require support." The matter is continuing to be debated by Nepal's government.

Source: International Press Service, 30 October 1995.

Interpol Joins Fight Against Illegal Wildlife Trade

Smuggling endangered species and their by-products generates \$5 billion in revenues each year, more than illegal weapons or gemstones. At a conference held in Jerusalem in November 1995, Interpol, the international police agency, was invited to become involved in finding a solution to this problem. The Nature Reserves Authority (NRA), with representatives from 20 European and Middle Eastern countries, says the problem of smuggled wildlife is the second largest source of illegal trade, trailing only drugs in revenue generated.

Israel took the lead in the effort to enlist the resources of Interpol. An Israeli spokesperson, Bill Clark, stated that since each nation has its own method of dealing with protected species, investigators pursuing leads run into bureaucratic snags when pursuing cases because of a lack of a uniform international system. The NRA believes that the involvement of Interpol would change this.

Several proposals were put forth at the conference including the creation of an international hot line and a list of contacts that will allow investigators to cooperate with one another quickly enough to intercept ships and planes carrying contraband. A second proposal had Interpol compiling a profile of a typical smuggler, similar to that used by airport security with respect to possible terrorists. An Interpol spokesperson stated that they were receptive to the plan and hoped to coordinate with both law enforcement and administrative services in all of the participating NRA countries to help prevent these types of crimes.

Source: Jerusalem Post, 15 November 1995

Births & Hatchings



Jacksonville Zoological Gardens (Jacksonville, FL)...announces the following B&H from October 1994 through September 1995:

Mammals - 0.1 giant anteater (*Myrmecophaga tridactyla*) [0.1 DNS]; 0.0.48 naked mole rat (*Heterocephalus glaber*) [0.0.42 DNS]; 1.0 Grant's zebra (*Equus burchelli bohmi*); 0.1 domestic zebu (*Bos primigenius indicus*); 1.0 greater kudu (*Tragelaphus strepsiceros*); 2.0 Thomson's gazelle (*Gazella thomsoni thomsoni*); 4.6 African pygmy goat (*Capra hircus*) [2.2 DNS]; 1.1 French alpine goat (*Capra hircus*).

Birds - 0.0.1 boat-billed heron (*Cochlearius cochlearius ridgwayi*) [0.0.1 DNS]; 1.1 marabou stork (*Leptoptilos crumeniferus*); 1.1 Kenya crested guineafowl (*Guttera pucherani*); 0.0.7 black-cheeked lovebird (*Agapornis nigrigenis*) [0.0.1 DNS]; 0.0.3 scarlet macaw (*ara macao*); 0.0.4 violet turaco (*Musophaga violacea*) [0.0.3 DNS]; 0.1.3 Leadbeater's ground hornbill (*Bucorvus leadbeateri*) [0.1.2 DNS]; 2.2.1 red-billed hornbill (*Tockus erythrorhynchus*); 0.0.5 white-headed buffalo weaver (*Dinemellia dinemellia*) [0.0.5 DNS]; 0.0.1 plush-crested jay (*Cyanocorax chrysops*) [0.0.1 DNS].

Reptiles/Amphibians - 0.0.30 African spurred tortoise (*Geochelone sulcata*) [0.0.3 DNS]; 0.0.9 West African dwarf crocodile (*Osteolaemus tetraspis tetraspis*); 0.0.3 Florida pine snake (*Pituophis melanoleucus mugitus*); 0.0.28 broken striped newt (*Notophthalmus viridescens dorsalis*) [0.0.28 DNS].

Of special interest are the continued hatchings of marabou storks and Leadbeater's ground hornbills. Rarely hatched in captivity, Jacksonville has hatched 14 marabou storks (3 DNS) and 30 Leadbeater's ground hornbill [16 DNS]. *submitted by Angela Cecil, President, Jacksonville AAZK Chapter, Jacksonville, FL.*

First Test-tube Gorilla Born

The world's first test-tube gorilla (*Gorilla g. gorilla*) was born five weeks premature on 9 October 1995 at the Cincinnati Zoo. The birth was not announced until it was certain the tiny 3.5lb female would survive the first critical weeks. The mother is Rosie who resides at the Cincinnati Zoo. The sperm donor was Mosuba who lives at the Henry Doorly Zoo in Omaha, NE. The embryos were implanted in March of last year. "When captive gorillas are not reproducing naturally, this technology can be used to include them in the gene pool -- an important step in preserving any animal species," said Dr. Betsy Dresser, Director of Research at Cincinnati. Dresser said there have been about ten futile attempts at test-tube gorilla birth; this was Cincinnati's first try.

Source: USA TODAY, 1 December 1995



Book Review

A Veterinary Guide to the Parasites of Reptiles

by Susan M. Barnard and Steve J. Upton, 1994

Kreieger Publishing Company

Kreieger Drive, Malabar, Florida 32950

Hardback, 154pp.

Review by Diane Callaway

Assistant Supervisor,

Wild Kingdom Pavilion

Henry Doorly Zoo, Omaha, NE

A Veterinary Guide to the Parasites of Reptiles is the first in a series of volumes dedicated to the diagnosis and treatment of reptilian parasites. This handy reference guide covers the five recognized phyla of protozoa that have been reported in reptiles. This includes Sarcomastigophora, Apicomplexa, Myxozoa, Microspora, and Ciliophora.

The first five chapters are dedicated to known parasitic protozoa of reptiles. Each protozoa is described in text and includes a photograph or illustration. Known hosts, host location, life cycle, transmission, symptoms, diagnosis, and treatment are adequately characterized for each protozoa as well.

Laboratory procedures for the herpetoculturist are also included, covering everything from basic fecal floats, various different stains and fixatives, blood stains, as well as post-mortem tissue smears. Products mentioned in text are included, listing manufactures and suppliers.

A proficient glossary and bibliography of approximately 250 references close this resourceful book.

This publication is presented in an intelligible manner, and will obviously be a functional part of any herpetoculturist's library.

The Rainforests of West Africa

by Claude Martin-1991

Birkhauser Verlag, Basel, Switzerland

255 pp, Hardback, \$20

Review by Philip T. Robinson, Secretary,

Society for the Renewal of Nature

Conservation in Liberia, West Africa

USA - Temecula, CA

In "Rainforests", Claude Martin has assembled the first cohesive nature book on the western rain forests of West Africa. He traces their history from early

European explorations to the present day conservation problems they face.

The ecology of these complex forests and their wildlife and peoples is covered in practical and readable detail. Examples are drawn from field studies, particularly in Ghana, as well as from experiences in field travels in Liberia and Cote d'Ivoire. Explanation of forest successional growth, key interactions of animals in seed distribution, and the dynamics of rainforests in Africa's rural economy and culture provide a balanced perspective of these complex and diminishing environments.

Martin has included over 160 photos, drawings and maps to assist the reader in developing a visual and sensual impression of these forests. The text is both educational as well as inspirational in promoting wiser forest utilization.

This hard cover publication is colorful and deserves a wide readership. The very modest price (\$US 20) is an extremely good literary value and is a major contribution to African conservation biology literature.

Can the Quagga Be Brought Back?

The last Quagga died in Amsterdam Zoo on 12 August 1883. For many years, some scientists have speculated on the possibility of re-creating the animal by controlled breeding from the southern plains zebras that showed brownish color and a lack of striping on the legs. Others, however, opposed this project on the grounds that the quagga was a separate species of zebra and could thus not be re-created—any animal produced, they argued, would merely be a 'look-alike', with no true genetic relationship to the extinct animal.



In the mid-1980s, however, three groups of scientists analyzed samples of dry muscle tissue and blood removed by R.E. Rau of the South African Museum during the remounting of four specimens there and in Germany. The scientists, all associated with the University of California but working independently and applying different molecular biochemical techniques, have shown that the quagga was so closely related to the plains zebra that it must be regarded as no more than a subspecies. As the plains zebra is still extant on both sides of the former range of the quagga, it is quite possible that its gene-pool contained many of the quagga genes, and hopefully enough to re-create the animal by means of appropriate selective breeding.

Once the taxonomic question was settled, a systematic breeding program was started in an attempt to retrieve the quagga genes and produce a new population of this animal. The program started with the capture of nine selected zebras in the Etosha Game Reserve in northern Namibia in March 1987. They were taken to a breeding farm about 200km north-east of Cape Town, and in subsequent years additional animals from Zululand and Natal were added to the breeding stock. They have

recently been moved onto four sites in the Cape Town area (one of which, Groote Schuur, part of the former Cecil Rhodes estate, is visible on the way into Cape Town from the airport). A number of second generation animals have now been born in the project. Some of these will be discarded because of their zebra-like appearance; others will remain in the project because they more closely resemble quaggas. Although the changes - increases in the brown coloration and a decrease in the stripes - are noticeable, it is evident that many generations will be needed to bring the project to a successful conclusion.

Persons wishing to contribute towards the project costs, or wanting further information, should contact: The Quagga Experimental Breeding Programme, South African Museum, P.O. Box 61, Cape Town 8000, South Africa.

Source: International Zoo News, Vol. 42/7, No. 264, Oct/Nov 1995 (author: Chris Moiser)

BOWLING FOR RHINOS PIN

Available from the Portland Chapter

Show your support for **Bowling for Rhinos** with this 3/4 inch, five-color enamel pin. Cost is \$3.00 each or save on orders of 25 or more at a cost of \$2.00 each. Send requests for pins to:

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Metro Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, OR 97221
(503) 226-1561, Ext. 255
Fax (503) 226-0074



U. N. Extinctions Report Grim

A new United Nations report estimates more than 30,000 plant and animal species now face possible extinction, compared with 484 animals and 654 plants that have gone extinct in the last four centuries. The U.N.'s Global Biodiversity Assessment is the first comprehensive look at extinction by scientists around the world. They found that species now threatened include 533 mammals, 862 birds, 257 reptiles, 133 amphibians, 934 fishes, 2,647 insects, and 26,106 plants. Their massive report, which was released in November during a news conference in Jakarta, Indonesia, says the rate of species extinction since humans first walked the earth may be 1,000 times what it would have been without human intervention.

Source: ESA Action - Internet: eicinfo@acpa.com

Official AAZK Membership Drive Enrollment Form

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Address _____

City _____ State/Province _____ Zip/Postal Code _____

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☐ \$30.00 Professional/U.S.
Full-time Keepers

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Other staff & volunteers

☐ \$25.00 Associate/U.S.
*Those not connected with
an animal facility*

Canadian Members

☐ \$35.00 Professional/Canada
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☐ \$30.00 Affiliate/Canada
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*Those not connected with
an animal facility*

Zoo Affiliation (if any) _____

Win a Free Trip to TEXAS by Joining in This Year's National Membership Campaign!

As an organization such as AAZK, Inc. continues to grow in size and commitment, the need for funding most certainly follows. While other organizations perpetually increase their membership fees, the Board of Directors of AAZK, Inc. have strived to keep fees down to an affordable level while still providing the membership with a vital link of communication for the zoo keeping profession through local Chapters and the *Animal Keepers' Forum*. As an alternative to increasing dues, the time has come for us to embark on a national membership campaign.

Within this new year we will see many new and exciting facets to the membership campaign, and we are counting on everyone's involvement to make it a success. The first phase of the campaign will kick off with a membership drive to increase our numbers. Anyone may participate either as an individual or as a Chapter member, and there are some enticing prizes offered to start us off!

The Grand Prize is a trip to Houston, TX for the 1997 AAZK National Conference. This trip will be awarded to the individual membership sponsor who raises the most funds by recruiting new members to the National Association.

We also have some great prizes for local Chapters as well. The Chapter that solicits the most funds by recruiting new members to the Association will have their choice of a great publication; and the five (5) Chapters that recruit the most new members will have their Chapter recharter fee waived for 1996!

This is your chance to help strengthen AAZK, Inc. (and it also means less money out of your pocket in the future) so arm yourself with the special membership application form and a pen and win your way to Houston! An official Membership Drive Enrollment Form is printed on the reverse side of this sheet. Please feel free to photocopy it as many times as you need to (only new memberships submitted on this form will be accepted in the contest), and don't forget to put your name on the membership sponsor line! Good Luck!

CONTEST RULES:

Individual Membership Sponsors

1. Membership sponsor **must** be a member of AAZK, Inc. to qualify.

2. All newly solicited members **must** submit a copy of the Official Membership Drive Enrollment Form to National AAZK, Inc., and the membership sponsor's name **must** be on this form to receive credit.

3. The winner will be chosen by total funds raised in new memberships in any of the applicable categories (Professional, Affiliate or Associate memberships).

4. In the event of a tie, the person with the most Professional memberships will be chosen.

5. All membership enrollment forms **must** be postmarked **by 1 July 1996**.

Grand Prize includes:

- Round-trip airfare to Houston, TX (up to \$500.00 U.S. Funds)
- Hotel accommodations (4 nights and 5 days)
- 1997 National AAZK Conference registration fee

(Hotel accommodations and waived registration fee provided by the Greater Houston Chapter of AAZK. THANKS!)

Chapter Membership Sponsors

1. Chapter **must** be in good standing with AAZK, Inc.

2. All newly solicited members **must** submit a copy of the Official Membership Drive Enrollment Form to National AAZK, Inc., and the membership sponsor's name as well as the Chapter **must** be on the form to receive credit.

3. The winning Chapter will be chosen by total funds raised in all categories (Professional, Affiliate or Associate).

4. In the event of a tie, the Chapter with the most new Professional members will be chosen.

5. All membership forms **must** be postmarked **by 1 July 1996**.

Chapter Prizes includes:

• **Grand Chapter Prize** is a choice of the following: AAZK's Zoo Infant Development Notebook two-volume set; AAZK Diet Notebook, Mammals, Vol. 1; or a subscription to a magazine or journal of the Chapter's choice (subject to a specific price range set by the Board of Directors).

• The 5 Chapters soliciting the most new members will have their **Chapter Recharter Fee waived** in 1996.



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- The 5 Chapters soliciting the most new members will have their **Chapter Recharter Fee waived** in 1996.

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Mail this application to: AAZK Administrative Offices, Topeka Zoo, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Make checks or money orders payable to AAZK, Inc. Must be in U.S. Funds Only. Membership includes a subscription to the *Animal Keepers' Forum*.

Must Be Postmarked by 1 July 1996 to Participate in Contest

AAZK Announces New Professional & Contributing Members

Andrew Arkway, **Roger Williams Park Zoo (RI)**; Laura Bartlow, Jennifer L. Hamilton, Christina Doyle, and Wayne A. Layton, **Ross Park Zoo (NY)**; Timothy J. Franz, **Palmetto, FL**; Kim Chriswell, **Orlando, FL**; Trish Vaughn, **Zooland Animal Park (AL)**; Donna Paquin, **Jackson Zoological Park (MS)**; Micki Hollan, **Cleveland Metroparks Zoo (OH)**; Michelle D. Studer, **Akron Zoological Park (OH)**; Bruce Fox, **Detroit Zoo (MI)**; Dawn M. Susain, **Brookfield Zoo (IL)**; Shelley Spears, **Peoria, IL**; Derek W. Bossi, **Dickerson Park Zoo (MO)**; Sharon Hensen, **Little Rock Zoo (AR)**; Brett Smith, **San Antonio Zoo (TX)**; Daryl Hosler, **America's Teaching Zoo (CA)**; Wendy S. Gordon, **The Gorilla Foundation (CA)**; Margaret Kolakowski, **Metro Toronto Zoo (Ontario)**.

Renewing Contributing Members

Lane Theriac, Director,
Washington Park Zoo, Michigan City, IN

Milwaukee County Zoo, Library,
Milwaukee, WI

John Tobias, Director,
Miller Park Zoo, Bloomington, IL

Dickerson Park Zoo, Springfield, MO

Gordon Henley, Director,
Ellen Trout Zoo, Lufkin, TX

Gerald W. Murrie, San Diego, CA

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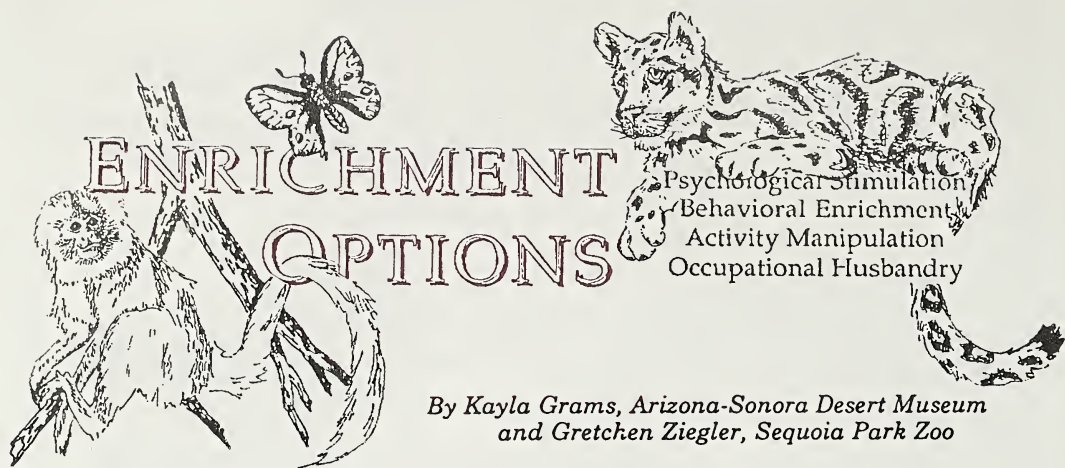
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AAZK, Inc.

**635 S.W. Gage Blvd.
Topeka, KS 66606-2066
U.S.A.**





By Kayla Grams, Arizona-Sonora Desert Museum
and Gretchen Ziegler, Sequoia Park Zoo

PRIMATES: On 27 March 1995, I implemented an enrichment activity for our 1.2.1 white-throated capuchin monkeys (*Cebus capucinus*). I made two orange and lemon flavored Jello® molds filled with a variety of fruits (apples, oranges, bananas, strawberries, grapes, and raisins). The animals had not received Jello® as a treat before, and I hoped they might like it.

Our dominant male, Thomas, was the first to investigate the Jello®, and seemed very interested. He first touched it with his hand, and watched as it jiggled. He then quickly picked out a raisin, and rolled it on the floor several times before eating it. He also became very protective of the Jello® when approached. One of our females, Mona, seemed a bit frightened of the Jello® at first as she approached it very cautiously. However, she did finally get up the courage to grab a strawberry from the Jello®, and dash atop her nightbox. She especially liked the Jello® itself, and I observed her several times grabbing large handfuls of it.

Our other female Sheba, also seemed a bit intimidated by this strange object. She too preferred the Jello® over the fruits. She especially disliked grapes, as she picked one out, wiped it off, and threw it down. Lastly, our juvenile male, Coaster, had some comical reactions. He approached the Jello®, touched it, watched it jiggle, and then jumped back with a puzzled expression on his face. He refused to pick the fruit out from the Jello®. He did not seem to want to touch the Jello®, perhaps because of its stickiness. He did, however, lick the Jello® from the enclosure floor several times.

Overall, this activity produced some interesting behaviors, and allowed the monkeys to use their manual dexterity skills, as well as their depth perception skills since the Jello® mold was a three-dimensional object. It also proved to be great fun for both the animals and the preparer.

—Michelle Hawk, Student
Santa Fe Teaching Zoo, Gainesville, FL

BEARS: We have two Alaskan brown bears (*Ursus arctos middendorffi*) in a 3/4 acre exhibit. For occupational enrichment we have put a bale of grass hay in their exhibit for the two bears to “play” with.

We use grass hay because the animals will nibble on it and straw is too fluffy for the activity level to be maintained for any length of time. The bale is placed about 20 or 30 feet away from their den. The bale is not broken up so the bears will do this themselves. We have also inserted peanuts and monkey chow into the flakes to stimulate their interest.

We have observed the bears jumping on the hay as if they were a cat making a soft spot to sleep. The female has been seen dragging an armfull at a time into their den. The male will lay spread-eagle on the now redistributed hay searching through it for a goodie he may have missed earlier.

The mess is cleaned up at the end of the week. The grass hay will not be introduced again for a couple of weeks in order to keep this exercise fresh for them.

Another enrichment activity for them during the time the grasses in their exhibit dry up is to give them fresh cut green grass. This grass is pulled by hand and free of any chemical contaminants such as pesticide sprays, etc.

—Marilyn Omlor, Senior Keeper
Walk in the Wild Zoo, Spokane, WA

SKINK: behavioral enrichment for prehensile tail skinks (*Corucia zebrata*) at the Philadelphia Zoo consists of adding browse consisting primarily of Mulberry (*Morus sp.*) twice a week. Other browse options consist of poplar (*Populus sp.*), forsythia (*Forsythia sp.*) and grape (*Vitis sp.*). After adding the browse to the diet the Philadelphia Zoo experienced an upswing in the number of births by this species. (One set of twins and a single birth.) Adding browse to the animals' cage stimulates natural climbing behavior and allows a more natural feeding method.

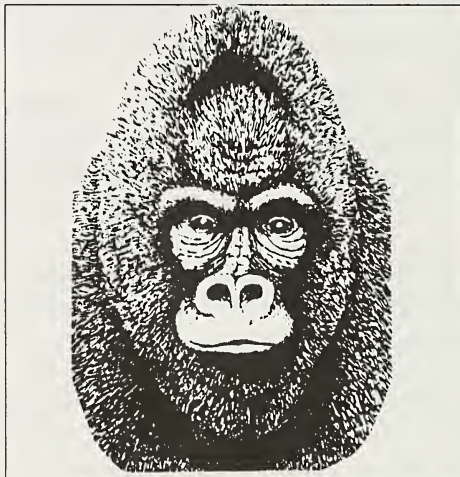


—Edward Kowalski, Reptile House
Philadelphia Zoo, Philadelphia, PA

Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas.

Mountain Gorilla Population Appears Lower Than First Thought

An article in the most recent issue of *African Wildlife Update* (Vol. 4, No. 6, Nov/Dec 1995) reports that the gorillas that inhabit Bwindi Impenetrable National Park in Uganda are not members of the mountain gorilla subspecies as has been thought. The findings represent extensive research and observations by Dr. Esteban Sario of the American Museum of Natural History in New York and Drs. Tom Butynski and Jan Kalina, both affiliated with Zoo Atlanta, Atlanta, GA.



The researchers found that, relative to the Virunga gorillas, those in Bwindi live at lower elevations and warmer temperatures, are much more arboreal, have longer day ranges and larger home ranges, and eat much more fruit and pith and less bamboo and leaves. These differences in habitat, ecology and behavior of the gorillas are reflected in their morphology, according to the researchers, with the Bwindi gorillas having smaller bodies; relatively longer limbs, hand and feet; shorter big toes, thumbs and cheek tooth rows; and narrower trunks and orbital breadths than the Virunga gorillas. Since the early 1990s, when the results of DNA tests on gorilla hair were announced, the widely accepted view has been that the Bwindi gorillas are mountain gorillas.

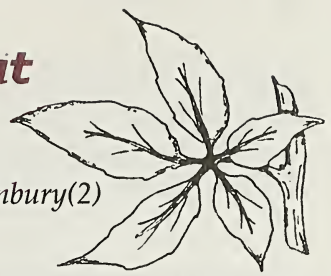
These new findings could have serious implications for the conservation of the mountain gorillas (*Gorilla gorilla beringei*). Instead of a total population of 620 animals in two regions - Bwindi and the Virunga Volcanoes of Rwanda, Zaire and Uganda - mountain gorillas are now apparently confined to the latter area and number about 320.

The researchers said further research is needed to determine whether the Bwindi gorillas are eastern lowland (*G. g. graueri*) or a unique subspecies.

African Wildlife Update is published six times a year by the African Wildlife News Service, a nonprofit, tax-exempt news agency (P. O. Box 546, Olympia, WA 98507-0546 USA). A minimum contribution of \$15 allows one to receive this informative and timely newsletter. Contributors living outside the U. S. must add \$7 for air mail postage. Limited back issues are available for \$2 each by contacting the Editor.

Planting for Enrichment at the Melbourne Zoo

by John Arnold(1) and Amanda Embury(2)



The Royal Melbourne Zoological Garden in Australia has recently developed several major naturalistic exhibits. These exhibits feature landscapes that promote natural behavioral repertoires; thus planting facilitates environmental enrichment. Melbourne Zoo's Horticultural Technician(1) and Project and Planning Coordinator (2) write about the processes involved.

Environmental enrichment is just one of many factors considered in the exhibit design process at Melbourne Zoo. The potential to promote natural behavior is perhaps the most critical factor when designing and accessing exhibits. Contributing to environmental enrichment is an objective of all exhibit plantings at Melbourne Zoo.

Prior to designing an exhibit for a species, its natural habitat, associated vegetation, and behavioral requirements are meticulously researched. Food plant lists and vegetation surveys provide the foundation for developing exhibit plant lists. The project team required for exhibit design includes a broad cross-section of Zoo staff, with animal husbandry and horticulture department staff being key players in the process.

Development of the design brief is often a lengthy process, but it is vital that all exhibit requirements are considered prior to commissioning the design. The "local knowledge" of zoo horticulture staff provides valuable information to designers about what is likely to succeed under Melbourne Zoo conditions.

The completed design brief creates a vision upon which the exhibit develops. The "vision" clearly defines the niche of habitat to be recreated—perhaps a pebble strewn stream meandering through rainforest for a small-clawed otter (*Onyx cinema*), or a sandy substrate with sparse plantings and artificial termite mound for a group of meerkat (*Surucata Suricatta*). The vision ensures that all involved in the design agree upon what is to be created. It cannot be stressed too strongly that environmental enrichment is a priority when defining the vision. From this foundation, other elements are factored in, such as visitor experience and maintenance of exhibit.

Successfully established exhibit vegetation is often the key element in environmental enrichment for zoo animals. The vegetation within an exhibit can cater to a wide range of animals' psychological and physical requirements such as food, shelter, shade, camouflage, sanctuary, perching, and nesting. The concept design document identifies all of these requirements to enable landscape architects to incorporate them into the design.

The selection of plant species for exhibits is largely undertaken by the Zoo's horticultural staff. Exhibit plant selection often needs to meet exacting criteria. Factors such as suitability of natural material to existing conditions (including climate, aspect, soils, toxicity, palatability, and weed potential), and the function and form of the plant material are all considerations made in the selection process.

There can be little doubt that naturalistic exhibits with appropriate vegetation enhance the environment of animal exhibits. There is, however, a need to strike a balance between an exhibit which is aesthetically pleasing for visitors and one which is stimulating for resident species. It is not merely a matter of creating a vista which looks like appropriate habitat. The planted exhibit must offer more than a museum diorama; it must be a three-dimensional, usable habitat. Compromises are inevitable; and when alternative species are required, it is often more important to select species that look like the "real thing" rather than a closely related species.

Many of the desired species for zoo exhibits are not commercially grown; thus the horticultural department has become extremely proficient in sourcing, propagating, producing, and cultivating a wide range of plant material. Some species have proved most successful; but there have been some failures. The trial and error process has resulted in extensive lists of suitable species for a wide range of exhibits at Melbourne Zoo. It has also provided the description of the designer zoo plant-one that can provide for a number of animal needs and survive and flourish under the extreme pressures associated with animal activities.



A spectacular example of a designer zoo plant at Melbourne Zoo is the African shrub *Sparmannia africana*, which is flourishing in the **Gorilla Rainforest** exhibit. This plant provides an effective screen; and, like a maze, creates an added dimension to the exhibit. The gorillas will occasionally browse on the foliage or strip the bark, but generally this is not life-threatening. When the plant is in flower (this occurs sporadically throughout the year), the gorillas will pick and eat individual flowers, carefully and gracefully removing them from the shrub.



While attempts are made to include food plant species within the exhibits, there are inherent problems associated. For example, it is not possible for exhibit plantings to sustain animals within the exhibit. For browsing species, provision for foraging is achieved largely through supplementary feeding of freshly cut branches. Melbourne Zoo has several plantations which are the sources of browse. Browse plantations are tended by horticultural staff, with husbandry staff providing details of appropriate species to be grown.

Plant protection is a further way of promoting their survival; but this normally does little for environmental enrichment. Melbourne Zoo's gorillas proved quite inventive at ways of "beating" electric fencing-from acrobatic cartwheels over it to shorting out the wires with bedding material. From the design perspective, when

designating "no go zones" for animals, it is important to think of how an exhibit will be used. If an animal wants access to a particular part of the exhibit because it receives the afternoon sun, efforts to cordon off the area will probably prove futile. It is also important to ensure that animals are able to access at least some of the plants within the exhibit. For example, if they are not allowed to climb on living trees, dead trees should be provided for climbing structures.

Landscapes can be further developed to allow a degree of flexibility and novel situations. While not always possible, exhibit furnishings should ideally be designed to be routinely changed. For example, configurations of ropes can be altered to create novel arboreal pathways; or small branches can be routinely replaced with new branches. Such changes can parallel a tree falling in a forest or other natural events. These changes provide stimulation for animals and prevent exhibits from becoming mundane.

We in the zoo industry have all probably witnessed the moment when a group of animals is first released into a recently landscaped and planted exhibit. Within days of the release of Melbourne Zoo's gorillas into their new rainforest exhibit, they were smashing down vegetation and building day nests—a hellishly difficult scenario for the zoo horticulturist, who had devoted many hours to nurturing the plants. However, the despair of seeing plants destroyed is more than compensated by seeing animals relishing in their new found habitat and demonstrating behavior typical of their species.

Successful exhibit management poses many challenges and headaches for the zoo horticulturist; but the rewards motivate all of us to continue planting naturalistic settings for environmental enrichment.

For more information on the design process or plant lists for exhibits, please contact the authors by facsimile at #61-3-285-9360.

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EcoFacts.....



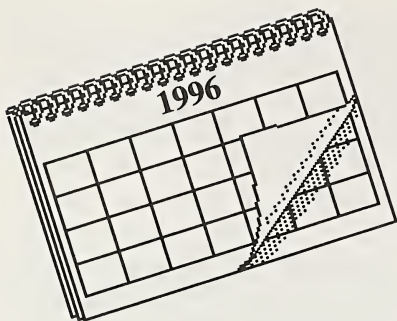
The things that won't leave. CFC molecules can continue to deplete stratospheric ozone for more than fifty years after they are released.



Food to go. The average item of food travels 1,200 miles in the United States before it is eaten.



Here's some good news. In America, about 1,500 aluminum cans are recycled every second.



Coming Events

The AZA Conservation Academy

February 17-22, 1996

St. Louis, MO

Will be held concurrently with School for Zoo & Aquarium Animal Management, Studbook Keeper's Course, and SSP Coordinators' Course. For further information contact Debra Boyster, Conservation Academy Coordinator, c/o St. Louis Zoo, Forest Park, St. Louis, MO 63110 (314) 781-0900, ext. 297.

AZA Principles of Elephant Management

February 18-21, 1996

St. Louis MO

Course held in conjunction with the courses offered by the Conservation Academy (see above listing). For further information contact Debra Boyster, c/o St. Louis Zoo, Forest Park, St. Louis, MO 63110 (314) 781-0900, ext. 297.

International Society of Zooculturists 9th Annual Conference

March 3-7, 1996

Lafayette, LA

Hosted by the Zoo of Acadiana, the conference will include paper sessions, a crawfish boil, visits to the Acadian Cultural Center and Henderson Swamp as well as a walking tour of historic St. Martinville and tour of the Zoo of Acadiana. To register or for further information call Linda Deshotels at the Zoo of Acadiana at (318) 837-4325.

Zoo Nutrition Seminar

March 16-17, 1996

Ithaca, NY

Offered at Cornell University, the course is designed for zoo veterinarians, nutritionists, and others with an interest in zoo animal nutrition and welfare. For further information, contact Zoo Nutrition, Box 101, Cornell University, B20 Day Hall, Ithaca, NY 14853-2801 (607) 255-7259, fax 255-9697, e-mail (sp@sce.cornell, edu).

17th Biennial Pronghorn Antelope Workshop

June 5-7, 1996

Kings Beach, CA

Sanctioned by the Western Association of Fish and Wildlife Agencies, the workshop has issued a **CALL FOR PAPERS** relative to the biology and management of pronghorn. Proposed session topics are: Management of Private Lands; Population Modeling and Survey Techniques; Capture and Translocation Techniques; Habitat Management; Genetics, Anatomy and Physiology; and Recovery Planning. An abstract of 250 words or less is **due by 19 January 1996**. Send abstracts and inquiries to Workshop Chairperson Laura Colton, California Department of Fish and Game, 1416 Ninth Street, Room 1280-9, Sacramento, CA 95814; Phone (916) 653-6886; Fax (916) 653-1019; and e-mail 73430.210@compuserve.com.

ZOOMANIA - 96 **Southeast Regional Docent Conference**

September 13-15, 1996

Gulf Breeze, FL

Focus of the conference will be educational programs and endangered species. Registration forms and hotel information is now available by contacting the Docent Council or Curator of Education at THE ZOO, 5701 Gulf Breeze Parkway, Gulf Breeze, FL 32561 or by calling (904) 932-2229, ext. 27.

AAZV 1996 Conference/Call for Papers

November 3-8, 1996

Puerto Vallarta, Mexico

The American Association of Zoo Veterinarians have issued a Call for Papers for this meeting. Session topics include: Invertebrate Management and medicine; Hand-rearing and Nursery management; New World Primates; Emerging Diseases; Marine mammals; Toxicology and Pest Control; Amphibians and Reptiles; Health of neotropical Ecosystems; Avian; Small Mammals and Carnivores; Charismatic Mega-vertebrates; and Case Reports. Student Competitions and a Poster Session will also be held. For information on submitting a paper, contact program chair Dr. Peregrine Wolff (612) 431-9361. For other information on the conference, contact Dr. Wilbur Amand, DVM, Executive Director at (610) 892-4812; Fax (610) 892-4813. Manuscripts must be submitted by 1 March 1996.

1996 AZA REGIONAL CONFERENCES

Central Regional - Feb. 28-March 2, 1996 - to be held in New Orleans, LA. For further information contact Craig Dinsmore, Audubon Zoo, P.O. Box 4327, New Orleans, LA 70178 (504) 861-6112.

Eastern Regional - April 10-13, 1996 - to be held in Greenville, SC. For further information contact Bob Wilson, Greenville Zoo, 150 Cleveland Park Dr., Greenville, SC 29601 (803) 467-4300.

Western Regional - May 15-18, 1996 - to be held in Denver, CO. For further information contact Angela Baier, Denver Zoo, 2300 Steele St., Denver, CO 80205 (303) 331-5805.

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.; 1-800-468-1966 (Canada). Our FAX is 913-273-1980.

CHIMPANZEE CAREGIVER...one full-time position open. Requires two years of college level course work, two years experience in the care of exotic animals; OR an equivalent combination of experience which provides the required knowledge, skills and ability. Primate experience a plus. Assist in the responsibility of caring for approximately 80 chimpanzees (*Pan troglodytes*) in a breeding colony. Must be willing to make a two-year commitment. Excellent benefits. EOE. Applicant must have a negative TB skin test, negative hepatitis B surface antigen test, and evidence of measles booster or natural disease prior to employment. Send letter of interest (with requested salary), resumé and three letters of reference to: Jo Fritz, Director, Primate Foundation of Arizona, P.O. Box 20027, Mesa, AZ 85277-0027. Position open until filled.

ZOOKEEPERS -Psittacines...requires minimum of one year paid, hands-on experience with macaws and degree or equivalent zoo-related experience. **Mammals...**requires minimum of one year paid, hands-on experience with ungulates and felines and degree or equivalent zoo-related experience. Duties for both positions include daily care, feeding, habitat upkeep, breeding programs, record keeping, medical coordination, training, acquisitions, supervising part-time staff/volunteers, and presenting educational programs, etc. Must be willing to work weekends/holidays. Starting salary \$15,000 - \$20,000 with year-end bonus and benefits. Excellent growth potential. Salary commensurate with experience. Send resumé/references to: Washington Zoological Park, 19525 SE 54th, Issaquah, WA 98027. FAX (206) 392-1076. Positions open until filled.

BIRD CURATOR...responsible for the management and development of collection. Must be able to supervise staff, communicate effectively and be team oriented. Will report directly to the Executive Director. Requires Bachelor's degree in zoology or ornithology or a closely related field, plus five (5) years experience in aviculture. Experience in supervision, development and maintenance of a facility and animal records necessary. Salary commensurate with experience. Send letter, resumé and three (3) references and salary history to: Marlayn Cragun, Tracy Aviary Curator Search, 1965 West 400 South, Salt Lake City, UT 84104. Inquiries should be directed to Board President, Laura Lockhart (801) 536-8278.

ANIMAL CARE SPECIALIST...requires excellent presentation/communication skills, hands-on experience with wild/exotic animals, and knowledge of animal husbandry/behavior, nutrition, and zoology. Responsibilities include, but are not limited to, presentation of wild/exotic animals in outreach settings, on-site educational show, daily animal care, exhibit maintenance, and record keeping. Salary \$7.00/hr., plus benefits. Send resumé to: Six Flags Magic Mountain, Animal Department, P.O. Box 5500, Valencia, CA 91385 (805) 255-4770.

The following two (2) positions are available at the North Carolina Zoological Park. Send resumé and cover letters by 31 January 1996 to: Human Resources, North Carolina Zoological Park, 4401 Zoo Parkway, Asheville, NC 27203, Attn: Guy Lichty. FAX (910) 879-2891.

MAMMAL SUPERVISOR (ZOOKEEPER III)...seeking candidates for the position of mammal supervisor in the African region of the zoo. Species in this area include primates, carnivores, hoofed stock and ratites. Experience with great apes, particularly chimps, and strong supervisory, interpersonal, and organizational skills are desired. For this position a four-year degree in zoology or a related field is preferred, as well as two (2) year's supervisory experience at an accredited zoo. Starting salary for this position is \$22,142.00, increasing to \$23,250.00 upon satisfactory completion of probation, plus benefits.

ZOOKEEPER I - Elephants/Rhinos...accepting resumé from zookeepers with elephant handling experience, willing to be part of a progressive elephant management team, working with an African bull and three cows, utilizing a protected contact system of elephant management. Other responsibilities will include the care and feeding of rhinos and a variety of African hoofed stock and birds.

SENIOR KEEPER/Bird Department/Baltimore Zoo...requires relevant college degree and two year's experience, or five year's zoo experience, two of which must be of supervisory level. Under the direction and guidance of the Curator, responsible for overseeing bird sections and supervision/training of staff. Salary commensurate with experience. Deadline for acceptance of applications is **31 January 1996**. Send resumé to the Personnel Dept., Baltimore Zoo, Druid Hill Park, Baltimore, MD 21217.

AREA SUPERVISOR...supervises the animal care and maintenance activities of zoo keepers, assigns and reviews the work of zoo keepers. Will administer medications, implement husbandry programs. Performs responsibilities of zoo keeper on occasion. Participates in zoo committees related to zoo operation, develops and submits reports on zoo operation. **Requirements:** a degree in zoology, biology or related field; must be able to lift 50 lbs.; minimum of 3-5 years zoo keeper experience is essential; some supervisory experience desirable. **Starting salary:** \$10.14/hr. plus benefits. **Deadline for application:** 25 January 1996. Send resumé to: City of Topeka/Personnel Division, 215 S.E. 7th, Room 170, Topeka, KS 66601.

ELEPHANT HANDLER...requires two year's experience. Duties include daily feeding, cleaning and husbandry of 1.5 African elephants in a hands-on management program that incorporates rides and demonstrations. Send cover letter and resumé to: Dan Beetem, General Curator, Wildlife Safari, P.O. Box 1600, Winston, OR 97496.

INTERNSHIP...The MVS Reptile Zoo, a nonprofit organization is seeking a student intern for the 1996 spring, fall and summer season. MVS is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The intern will

assist in the captive maintenance of the zoo's reptile collection, collect admissions in the exhibit, give interpretive talks and interact with the public; assist with educational outreach programs; and perform other duties as assigned. In addition, the intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern will **not be involved** in the handling of any venomous reptiles. Desirable qualifications include a willingness to handle snakes and other reptiles on a daily basis, ability to communicate effectively with people, writing skills, orientation to details and self-motivation. Students majoring in the biological and natural sciences are preferred. Former interns have arranged for academic credit with their colleges and universities. Salary and benefits include experience with the most extensive and diverse collection of snakes in the area, housing and a \$55/week stipend. Personal transportation is recommended. Starting dates are flexible, but a minimum commitment of three months covering SPRING (March-May), or SUMMER (June-August), or FALL (September-November). To apply send a cover letter and resumé to: James R. Harrison, Executive Director, MVS Reptile Zoo, 1275 Natural Bridge Road, Slade, KY 40376. **Deadlines for applications are:** Spring - 1 February 1996; Summer - 20 March 1996; Fall - 15 June 1996.

FULLTIME REPTILE KEEPER...the Miami Valley Serpentarium (MVS), a nonprofit organization, is seeking a full-time reptile keeper. MVS is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The position will be in charge of the captive maintenance of the zoo's reptile collection; will give interpretive talks and interact with the public; supervise the educational outreach programs; supervise interns and part-time staff; and perform other duties as assigned. Starting salary is \$7.00 per hour. To apply send cover letter and resumé to: James R. Harrison, Executive Director, MVS Reptile Zoo/Captive Born Venoms, 1275 Natural Bridge Rd., Slade, KY 40376. Deadline for application is **1 March 1996**.

MARINE MAMMAL KEEPER/TRAINER...under the supervision of the Assistant Curator of Mammals. Responsible for the care and handling of the colony animals and exhibits; training of animals and presentation of the animals for public, education display programs; design and development of these programs. Supervises other marine mammal staff and volunteers. Willingness to work weekends, holidays and evenings as required. Associate degree in biology, animal behavior or related field preferred. SCUBA certification, current TB test, current tetanus shot, and ability to lift 50 lbs. required. Valid driver's license required. Send resumé to: Carolyn Munn, Assistant Curator of Mammals/Primates-Sea Lions, Audubon Institute, P.O. Box 4327, New Orleans, LA 70178. EOE. Audubon Institute is a drug-free workplace.

ZOO CURATOR...Mickey Grove Zoo, Lodi, CA - requires graduation from an accredited four-year college/university with a major in zoology or related biological science; three year's experience in the care, propagation and procurement of animals for a zoo, including one year as a supervisor; additional qualifying experience may be substituted for the required education on a year-

for-year basis to a maximum of two years. Responsible for planning, supervising, and participating in the procurement, display and care of animals; arranges for the care and transportation of animals in transit; assigns, schedules, supervises and evaluates animal care staff; assists in the handling and treatment of animals requiring medical care; writes reports and articles and gives lectures on animals; and participates in preparing and monitoring portions of the zoo budget. Salary \$2,390.00 to \$2,905.00/mo., plus excellent benefits. Apply to: San Joaquin County Personnel, 24 E. Hunter, Room 106, Stockton, CA 95202, (209) 468-3272 by **9 February 1996**. Resumés received from applications by the filing deadline will be sent a standard County application. EOE.

REPTILE KEEPER...responsible for all aspects of daily animal care for a collection of 500 amphibians and reptiles representing over 180 species. Requires a degree in biology or a related field and a minimum of one year of work experience with reptiles and amphibians. Two or more years of experience can substitute for the degree. Must have experience with or ability to be trained in handling venomous reptiles. Salary \$11.55/hr. Send cover letter and resumé to: Human Resources, The Philadelphia Zoo, 3400 West Girard Ave., Philadelphia, PA 19104.

Two (2) positions available at The Oakland Zoo. For either position submit resumé and references to: Colleen Kinzley, Curator, The Oakland Zoo, P.O. Box 5238, Oakland, CA 94605. FAX (510) 635-5719. Deadline for applications is 31 January 1996.

PRIMATE KEEPER ...minimum one year experience with primates; extensive use of operant conditioning and training management behaviors required. Pay is \$10 /hr plus benefits.

AHT (RVT)/KEEPER...minimum one year experience in zoo or exotic animal setting. This position involves both keeper work and assisting in operation of veterinary care center. Pay \$10/hr plus benefits; possible adjustment with license.

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b - Birth

c - Chapter News Item

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id - Infant Development

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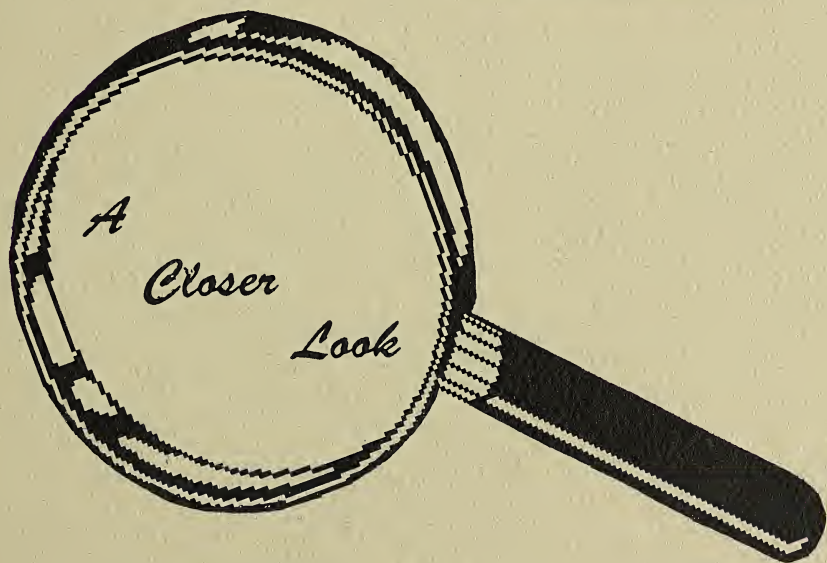
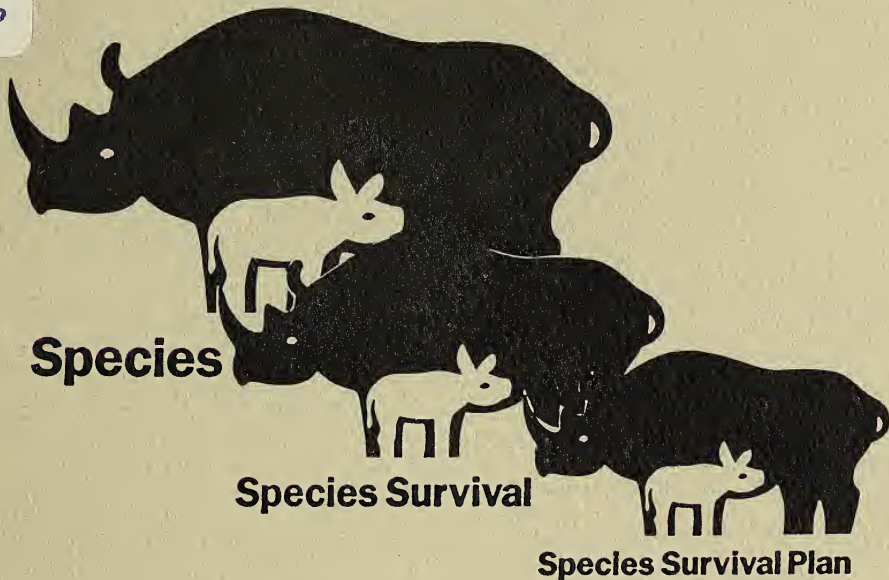
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FEBRUARY 1996

ANIMAL KEEPERS' FORUM, 635 S.W. Gage Blvd., Topeka, KS 66606-2066

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February 1996

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Diet Notebook, Mammals, Vol. II

Susan Bunn Spencer, Rockford, MI

Incubation Notebook Project

Scott Tidmus, Sedgewick County Zoo, Wichita, KS



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About the Cover.....

This month's issue takes a closer look at the Species Survival Plan® program of the American Zoo and Aquarium Association (AZA™). The rhinos in the logo represents a flagship species for the many other species threatened by denegregation of their habitat, human population and agricultural encroachment, and illegal hunting.

Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm]) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for *AKF*. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

Deadline for each regular issue is the 10th of the preceding month.

**Dedicated issues may have separate deadline dates
and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the *AKF* staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by AAZK, Inc.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

Scoops & Scuttlebutt



From the Editor

The editorial staff of *AKF* is pleased to present this special issue dedicated to a better understanding of the AZA™ Species Survival Plans®. We hope the articles it contains will increase your knowledge of this important conservation tool and perhaps encourage you to become more involved, both at your facility or on a broader scale nationally or internationally. We would like to thank all of the authors who contributed to this special issue for sharing their expertise and thoughts with us. We would especially like to thank Bob Weise, Assistant Director of Conservation & Science (AZA) for his contributions and encouragement for our efforts to make this issue a reality.

Denver Auction Success Bolsters AAZK Treasury

The highly successful auctions held during the 1995 National AAZK Conference in Denver, CO have brought a much-appreciated windfall to the AAZK bank account. Administrative Offices recently received a check for \$2400 from the Rocky Mountain AAZK Chapter. This amount represents a 33% share of the \$7204.32 raised at the auctions (actually a bit more since they kindly rounded the actual amount to the nearest hundred). Conference Treasurer Karen Stern also reported that the \$165 raised from the auction of an animal print was sent to the International Snow Leopard Trust in memory of Elandra Aum, long-time AAZK member who died last May.

Zoo Infant Development (Birds) Seeks Chairperson

Wanted: Chairperson for the Zoo Infant Development Project for passerine birds. We are currently seeking an individual willing to take on the job of developing the Passerine section of the ZIDP Notebook. The Mammal section has already been published, and has proven to be very useful to staff of zoological and other institutions. Various chairpersons are taking on the task of developing data for reptiles, amphibians and non-passerines. If you are interested, please contact the Board Oversight Marilyn Cole, Box 335, Pickering, Ontario L1V 2R6, Canada; phone (905) 683-2116; fax (905) 683-5897; e-mail cotercc@maple.net.

Elephant Training School Scheduled

The Third Annual Comprehensive School in Elephant Training, Handling and Safety Procedures will be held from 3-31 May 1996 at Riddle's Elephant Breeding Farm and Wildlife Sanctuary. The Schools will be conducted in 2, two-week sessions and will cover a variety of elephant management related topics as well as hands-on training. It will be taught by Robert "Smokey" Jones. For registration information contact: Riddle's Elephant Breeding Farm and Wildlife Sanctuary, Attn: Heidi Riddle, Education Coordinator, P.O., Box 715, Greenbrier, AR 72058; Phone (501) 589-3291/ FAX (501) 589-2248.

Message from the President....

Greetings from the Lone Star State!

This issue of the Animal Keepers' Forum has been dedicated to the Species Survival Plan© (SSP), the cooperative population management and conservation program for selected species in zoos and aquariums in North America. Many of us have the opportunity to work with SSP animals, but we are not directly involved with the paperwork. There is an alphabet soup of acronyms out there. This dedicated issue should assist us in understanding the system and possibly direct some toward a more active participation in a specific program.

Our organization annually recognizes an individual, a Chapter or an institution that is deserving of one of the five National AAZK Awards. These five awards are the Certificate of Excellence in Exhibit Renovation, the Jean M. Hromadka Excellence in Zoo Keeping Award, the meritorious Achievement Award, the Lifetime Achievement Award, and the Certificate of Merit for Zoo Keeper Education. Anyone qualified is eligible to receive these awards. Additional criteria and information on these awards began in the January issue of AKF and will continue through May. The deadline for AAZK Award nominations is **1 June 1996**. Inquiries and nominations may be sent to Jan McCoy, AAZK Awards Committee Chair, Metro Washington Park Zoo, 4001 S.W. Canyon Rd., Portland, OR 97221-2799.

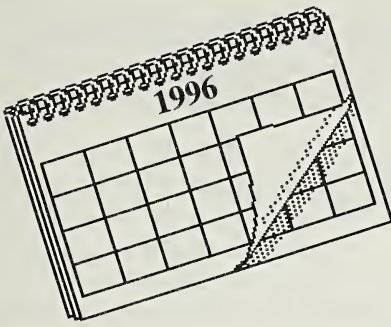
Each year the AAZK Board of Directors presents awards in two categories. The Certificate of Appreciation is given to an individual or organization outside of the American Association of Zoo Keepers, Inc. for deeds on behalf of AAZK and its members. The Certificate of Recognition is given to outstanding AAZK members for their work on behalf of AAZK, Inc. Send nominations for either of these awards to, David Luce, AAZK, Awards Board Oversight, Chaffee Zoo, 4277 W. Princeton, Fresno, CA 93722.

Last month, AAZK kicked off the year with the 1996 Membership Drive. There are many untapped resources out there and several right under our noses. At our own institutions there are docents, volunteers and students who can all be members of AAZK. These new members may take advantage of the many services and committees offered by AAZK. They can also benefit from the savings of member prices on publications and for conferences. The greatest benefit is the exchange of information and communication among members through the *Animal Keepers' Forum*, the monthly journal of AAZK, Inc.

The Midyear Board of Directors Meeting will be held at the Administrative Offices of AAZK in Topeka, KS, March 28-31. This is the time for the Board to review goals and objectives, set policies, and to ensure the direction of the Association. If you have any ideas, suggestions, or any items for discussion, please contact any Board member or send it to the Administrative Offices of AAZK. This is your Association. You can make a difference.

A final reminder that Chapter Recharter packets are due **15 February 1996** at the Administrative Offices.

---Ric Urban, AAZK President



Coming Events

International Society of Zooculturists **9th Annual Conference**

March 3-7, 1996

Lafayette, LA

Hosted by the Zoo of Acadiana, the conference will include paper sessions, a crawfish boil, visits to the Acadian Cultural Center and Henderson Swamp as well as a walking tour of historic St. Martinville and tour of the Zoo of Acadiana. To register or for further information call Linda Deshotels at the Zoo of Acadiana at (318) 837-4325.

Zoo Nutrition Seminar

March 16-17, 1996

Ithaca, NY

Offered at Cornell University, the course is designed for zoo veterinarians, nutritionists, and others with an interest in zoo animal nutrition and welfare. For further information, contact Zoo Nutrition, Box 101, Cornell University, B20 Day Hall, Ithaca, NY 14853-2801 (607) 255-7259, fax 255-9697, e-mail (sp@sce.cornell.edu).

17th Biennial Pronghorn Antelope Workshop

June 5-7, 1996

Kings Beach, CA

Sanctioned by the Western Association of Fish and Wildlife Agencies, the workshop has issued a CALL FOR PAPERS relative to the biology and management of pronghorn. Proposed session topics are: Management of Private Lands; Population Modeling and Survey Techniques; Capture and Translocation Techniques; Habitat Management; Genetics, Anatomy and Physiology; and Recovery Planning. Inquiries to Workshop Chairperson Laura Colton, California Department of Fish and Game, 1416 Ninth Street, Room 1280-9, Sacramento, CA 95814; Phone (916) 653-6886; Fax (916) 653-1019; and e-mail 73430.210@compuserve.com.

Association of Avian Veterinarians' Conference

August 27-31, 1996

Tampa, FL

The theme is "Bridging the Gulf" between traditional avian orientation and the reality of avian-exotic practice. Will include avian sessions on infectious diseases, aviculture, practice management, environmental topics, and ratites; a Small Mammal Symposium;

Pet Fish Lab and Master Class; Labs, Technicians program and more. For further information contact the AAV Conference Office, 2121 So. Oneida St., Ste. 325, Denver, CO 80224; Phone# (303) 756-8380/Fax (303) 759-8861/e-mail AAVConfOfc@aol.com.

ZOOMANIA - 96 **Southeast Regional Docent Conference**

September 13-15, 1996

Gulf Breeze, FL

Focus of the conference will be educational programs and endangered species. Registration forms and hotel information is now available by contacting the Docent Council or Curator of Education at THE ZOO, 5701 Gulf Breeze Parkway, Gulf Breeze, FL 32561 or by calling (904) 932-2229, ext. 27.

1996 AZA™ REGIONAL CONFERENCES

Central Regional - Feb. 28-March 2, 1996 - to be held in New Orleans, LA. For further information contact Craig Dinsmore, Audubon Zoo, P.O. Box 4327, New Orleans, LA 70178 (504) 861-6112.

Eastern Regional - April 10-13, 1996 - to be held in Greenville, SC. For further information contact Bob Wilson, Greenville Zoo, 150 Cleveland Park Dr., Greenville, SC 29601 (803) 467-4300.

Western Regional - May 15-18, 1996 - to be held in Denver, CO. For further information contact Angela Baier, Denver Zoo, 2300 Steele St., Denver, CO 80205 (303) 331-5805.

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AAZK Award Nominations Are Now Being Accepted for 1996!

The AAZK Awards Committee is accepting nominations for the **Jean M. Hromadka Excellence in Zookeeping Award (EZ)** to be presented at the 1996 AAZK Conference in Detroit, MI. The deadline for all award nominations is **1 June 1996**. Information concerning the qualifications, nomination procedure, selection procedure and an explanation of the awards may be obtained by contacting Janet McCoy, Chair, AAZK Awards Committee, Washington Park Zoo, 4001 S.W. Canyon Rd., Portland, OR 97221.

Jean M. Hromadka AAZK Excellence in Zookeeping (EZ) Award

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Jean M. Hromadka Excellence in Zookeeping Award presented by the AAZK Awards Committee. The purpose of the award is to recognize achievement and determination of an individual in the zookeeping field and in fostering professionalism. Zookeeping is a science combining zoology, biology, animal management, behavioral observation and daily record keeping on the collection of species in their care. This is essential knowledge for maintaining a species effectively in captivity. The excellent zookeeper must excel in one or more of these areas, but not be lacking in any of them.

The character of the award includes; a plaque, letter of notification to the institution's director and national recognition by professional journals. Such journals include: the American Zoo and Aquarium Association (AZA) and the Canadian Association of Zoological Parks and Aquarium (CAZPA) Newsletters, Animal Keepers' Forum (AAZK), Awards, Honors and Prizes: Volume 1; United States and Canada. The latter is published by Gale Research Company based in Wheaton, MD and found in medium to large sized libraries across the U.S. and Canada.

The Excellence in Zookeeping Award was founded by John Siegel, 1974-1975 CHAIR, in 1974. The original name of the award was the Marlin Perkins Award, named after the famed zoologist who started his career as a zookeeper. The name was changed in 1978 to the EZ award. In 1990, the name was changed to the Jean M. Hromadka Excellence in Zookeeping Award in memory of her outstanding contributions to the furtherance of AAZK through committee work and as President. The award is presented at the annual AAZK National Conference.

Qualifications:

1. The nominee must be a full-time animal keeper, employed in any North American zoological institution, aquarium or related facility.

2. The nominee must have been employed at least two years on permanent status at a zoo, aquarium or related facility.

3. The nominee must be nominated by his or her peers who have also been employed at that same zoo, aquarium or related facility. Supporting nominations may be submitted by management personnel from the same institution.

Nomination Procedure:

1. List name, position, institution's name, address, phone and Director, years of service in the field and the recommendation of peers or colleagues.

2. List and document outstanding achievements: exhibits, breeding, education, etc.

3. List any extra activities outside of zoo, aquarium or related facility work: working with conservation groups, youth, wildlife officials, etc.

4. Deadline for nominations is JUNE 1st of each year.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.



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Philadelphia Zoo Loses 23 Primates in Devastating Early Morning Fire

On 24 December 1995, the Philadelphia Zoo suffered the loss of 23 primates due to an early morning fire in the World of Primates Exhibit. Lost in the fire were six western lowland gorillas (*Gorilla g. gorilla*); three Bornean orangutans (*Pongo pygmaeus*); four white-handed gibbons (*Hylobates lar*); two ruffed lemurs (*Lemur variegatus*); two mongoose lemurs (*Lemur mongoz*); and six ring-tailed lemurs (*Lemur catta*).

The fire, which originated in the ceiling of the one story masonry structure, was reported to the Philadelphia Fire Department at 12:45 a.m. and the fire was placed under control at 1:09 a.m. The fire was confined to the ceiling of the \$6 million facility. All of the primates died from smoke inhalation and were not burned.

In the aftermath of this devastating fire, Zoo President Pete Hoskins has launched an investigation. Hoskins is assembling a panel of experts to examine all personnel, construction and systems related to the fire.

According to the Philadelphia Fire Commissioner Harold Hairston, the fire began as a result of the faulty installation of heat tape wrapping a pipe in the ceiling of the structure. The heat wrap tape is likely to have been part of the building's original construction (building opened in 1985). An alarm on the roof may have sounded, but could have been muffled by the snow surrounding it. The commissioner said there was no evidence that smoke detectors mounted within the World of Primates worked at the time of the fire. Hoskins notes, however, that neither is there evidence that the smoke alarms did not work. The Fire commissioner estimated that the fire may have been in progress for two hours before the fire was noted by guards and the fire department called. Hoskins noted that all the points cited by the Philadelphia Fire Commissioner will be examined in the investigation, including a review of the original construction of the World of Primates.

In September, the security and alarm systems at World of Primates were tested and found in working order. The staff began a zoo-wide review and upgrade of security systems more than a year ago. The zoo is continuing to improve such systems, including installing centralizing monitoring equipment, sprinkler technology and smoke detection. In addition, the zoo will take advantage of staff training offered by the Philadelphia Fire Department.

Public response has been overwhelmingly positive. "As a fully accredited member of the American Zoo and Aquarium Association, the Philadelphia Zoo had the full sympathy and support of AZA and its members," said Syd Butler, Executive Director of AZA. "We will be helping the Zoo, and its saddened staff through the process of rebuilding and future growth."

Nearly \$10,000 in individual donations arrived at the Zoo on December 27 alone, with numerous offers of help and materials. To help address the fire and its consequences, a fund for contributors has been established with a \$10,000 contribution by PNC Bank, a sum matched by a Zoo board member. On January 2, 1996, the first check from this recovery fund in the amount of \$250,000 was received by the Zoo. Donations are being directed to: The Zoo Renewal Fund, c/o PNC Bank Public Affairs, 100 S. Broad St., Philadelphia, PA 19101.

The following comments are from the World of Primates Keeper Staff at the Philadelphia Zoo:

Jo Anne Adams, Primate Relief Keeper: "After reading all the faxes, letters and cards, we have realized how deeply this has affected so many others besides ourselves. Your support has meant a great deal to us and will continue to do so as we all try to recover. We plan to do a follow-up in next month's AKF with a special tribute to the spirits lost to us and the zoo community."

Julia Unger, Lead Keeper, World of Primates: "While the grieving process is just beginning for many, one thing is for certain - this tragedy has deeply affected all who loved, cared for, or were in some way touched by these magnificent beings. Even those unfamiliar with our individuals grieve with us. This is evident from the outpouring of caring and support from zoos everywhere. We are truly part of an incredibly special community. To everyone, a huge, heartfelt Thank You."

Julia also sent AKF the following quote which eloquently sums up what zoo people everywhere can identify with.....

"We, who choose to surround ourselves with lives even more temporary than our own, live within a fragile circle ~ easily and often breached. Unable to accept its awful gaps, we still would live no other way. We cherish memory as the only certain immortality, never fully understanding the necessary plan."

-Anonymous

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Those interested in presenting a paper or poster presentation, or proposing topics for workshops and roundtable discussions please submit a short abstract. Include name of presenter, zoo affiliation, title of paper, the proposed format and any equipment that might be needed for the presentation. **Please submit abstract by 1 July 96.**

Presenters will be allowed 20 minutes which should include time for questions. Workshops and roundtable discussions will be given individual consideration for time that is needed.

Send abstracts, program questions and suggestions to :

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PRE AND POST CONFERENCE TRIP ANNOUNCEMENT:

5OCT96: Trips to Binder Park Zoo and John Ball Park Zoo

11-13OCT96: Trips to Sea World of Ohio, Cleveland Metroparks Zoo and The Wilds.

Evolution of the AZA Species Survival Plan

*By Robert J. Wiese, Assistant Director, Conservation & Science
and Michael Hutchins, Director, Conservation & Science
American Zoo and Aquarium Association, Bethesda, MD*

Goal of the Species Survival Plan

In 1980 "conservation" was made the highest priority of the American Zoo and Aquarium Association (AZA™) and the Species Survival Plan (SSP®) was initiated to cooperatively manage captive populations of endangered and threatened species (Meritt, 1980). The primary goal of the SSP in the 1980s was population management (i.e., genetics and demographics) to retain a self-sustaining genetic reservoir for future reintroductions (Foose, 1986; Seal, 1986).

Since those early days, the operation and vision of the SSP has evolved dramatically. The species' basic biology and husbandry are now given equal weight with genetics and demographics when determining breeding recommendations (Hutchins and Wiese, 1991). The focus on retaining species in captivity primarily for reintroduction has been replaced by the attitude that SSPs must be relevant today, not just 100 or 200 years from now. The need to retain significant amounts of gene diversity in well-managed, captive populations as a reserve for future reintroduction is still important for many SSP species and many improvements in our genetic management methodology have occurred. Retention of gene diversity is especially important for those species that are extinct or dramatically reduced in the wild (e.g., black-footed ferrets, Micronesian kingfisher, Mexican wolf).

However, there are many other ways that captive populations can support the conservation of their wild counterparts. Goals focused on public education, professional training, basic and applied research, technology transfer, and fund raising to support field projects such as national parks and reserves have been added to many SSPs. The SSP has truly grown into a holistic conservation program (Wiese and Hutchins, 1994; Wiese et al., 1994; Hutchins and Conway, 1995; Hutchins et al., 1995; Sunquist, 1995; Hutchins et al., in press).

To reflect these changes, the AZA Wildlife Conservation and Management Committee (WCMC) developed a mission statement for the SSP in 1994.

"The mission of the American Zoo and Aquarium Association's (AZA's) Species Survival Plan (SSP) program is to help ensure the survival of selected wildlife species. The mission will be implemented using a combination of the following strategies:

- Organize scientifically managed captive breeding programs for selected wildlife as a hedge against extinction.
- Cooperate with other institutions and agencies to ensure integrated conservation strategies.
- Develop and implement strategies to increase public awareness of wildlife conservation issues, including development and implementation of education strategies at our member institutions and in the field, as appropriate.
- Conduct basic and applied research to contribute to our knowledge of various species.
- Train wildlife and zoo professionals.
- Develop and test various technologies relevant to field conservation.
- Reintroduce captive bred wildlife into restored or secure habitat as appropriate and necessary.”

Selection Criteria for Species Survival Plans

The first ten Species Survival Plans were designated in 1981 after a lengthy review process by the AZA WCMC to select species that met specific criteria. The species selected (Asian lion, Asian wild horse, Bali mynah, barasingha, gaur, golden lion tamarin, Grevy's zebra, okapi, scimitar-horned oryx, and tiger) were highly endangered, possessed a suitable starting population in North American zoos, and had great potential for support. The selection criteria originally set forth by the WCMC were fairly specific, recognizing that limited captive space would require careful selection of only a few of the needy species to be designated as SSPs (Meritt, 1980).

As the 1980s progressed there was a gradual evolution of the philosophy surrounding SSP designation; the Noah's Ark Paradigm was born (Foose, 1986; Seal, 1986; Foose et al., 1992). This Paradigm was valuable in that it focused zoo and aquarium attention on conservation at a time when recreation was the primary focus. However, it also represented a shift away from the recognition that space was limiting and represented a belief that thousands of species could be saved by captive breeding for reintroduction at some unspecified future date when human populations have stabilized and habitats have been restored (Hutchins et al., 1995). In effect this Paradigm tried to save it all. Thus, additional species were added with much less attention to the original criteria. Essentially species were designated as SSPs if someone with an interest in a species was willing to write the initial petition and commit to undertake the program's coordination.

Formalization of the AZA Taxon Advisory Group (TAG) concept in 1990 (Hutchins and Wiese, 1991) brought back an attempt to focus the selection of SSP species on a few species for which active, holistic programs could be developed. The intent was to have fewer, high quality, holistic SSPs, rather than numerous, inadequately sized populations competing for space with one another to the detriment of them all. Through the TAGs, the North American zoo and aquarium community prioritize species according to specific taxon-based criteria (Hutchins

et al., 1995), many identical to the original selection criteria developed for SSPs (Meritt, 1980). TAGs recommend studbooks, SSPs, and other management programs and identify an appropriate amount of captive space. Giving realistic attention to available space is a significant new criterion. Today, designation of an SSP by the AZA WCMC requires that the TAG has previously prioritized the species on its North American Regional Collection Plan and, hopefully, has identified sufficient animal spaces and human and financial resources to operate the program successfully.

Operation of the Species Survival Plan

The first step in the formation of a Species Survival Plan is to have an AZA Taxon Advisory Group complete their North American Regional Collection Plan which recommends the species for an SSP and designates captive space for the program. Once a potential Species Coordinator is identified by the TAG, it is that individual's responsibility to receive support from their institution and complete and submit an application to the AZA WCMC. The WCMC reviews the petition and approves or denies the SSP© and the Species Coordinator. The only strict criteria to fill this position is that the person is employed by an AZA institution and is an individual member of AZA at some level. Species Coordinators currently come from the ranks of director, curator, keeper, registrar, etc.

Once recognition of the SSP has been gained from the WCMC, organization of the program begins. The Species Coordinator distributes a Memorandum of Participation (MOP) to all AZA institutions that hold the species. Institutions wishing to participate sign the MOP and thereby agree to abide by the decisions of the SSP and manage their animals cooperatively as part of a larger population for the benefit of the species. Virtually all AZA institutions sign MOPs if they hold the SSP species. Non AZA institutions or individuals can also sign MOPs and agree to participate once they have been approved by the WCMC. The approval process for non AZA members is designed to ensure that SSP animals will be cared for properly, that the institution or individual is financially able to remain committed for a long period of time, and that the animals will be managed as part of the SSP population.

Each participating institution identifies an individual to communicate with the SSP and represent the institution and their animals. From these institutional representatives, a subgroup of those with an interest and expertise in the species and time to commit are selected to form the SSP Management Group. If the number of interested individuals is large, an election is held to determine the Management Group. Management Group members help the Species Coordinator by assisting with Master Plan development, writing and editing the Husbandry Manual, spearheading special projects, raising funds for research or field conservation support, etc.

The Species Coordinator's responsibilities were once primarily fulfilled by one person. Today, the Species Coordinator is encouraged to actively use the

Management Group members to complete the many tasks associated with a successful SSP. There are also a number of other resources throughout the AZA Conservation Program network for assistance. The Studbook Keeper, if not the same person as the Coordinator, is especially important in the success of an SSP. Animal records must be up to date if they are to be useful in the completion of a Master Plan and breeding recommendations. The relevant Taxon Advisory Group, of which the Coordinator is an automatic member, is available to assist with larger issues that affect several related SSP programs, such as prioritization of space. The AZA Fauna Interest Groups are organized geographically and provide contacts and support in the species' natural range. These contacts can be extremely beneficial in developing in-country education, research, habitat conservation, and reintroduction programs. The AZA Scientific Advisory Groups provide expert advice in the scientific disciplines of Behavior and Husbandry, Contraception, Genome Banking, Nutrition, Reintroduction, Small Population Management, Systematics, and Veterinary Science. Courses on population management, people management, and running an SSP are also available for the Coordinator through the AZA Conservation Academy. Many SSPs are also appointing nonscientific advisors from AZA institutions to assist with the more holistic goals related to education programs, public relations, and development.

The AZA Conservation and Science (C&S) Office is available to give structure, advice, and direction to the Coordinator. Along with the AZA Development Department, the C&S Office also manages the AZA Conservation Endowment Fund which gives grants to support active conservation projects proposed by the SSPs and other AZA committees. The C&S Office believes it is partially our responsibility to raise funds to make SSP projects a success. The AZA also employs full-time staff in the areas of Education, Development/Marketing, Public Affairs, and Legislative Affairs to provide assistance and guidance for the Species Coordinators upon request.

Summary

The AZA Species Survival Plan has grown and evolved dramatically in its first 15 years of existence. Today, there are 77 SSPs covering 128 species. The majority of these SSPs are striving to become much more than the population management programs originally envisioned. These more holistic goals are realized by including activities focused on public education, professional training, development and transfer of technology, fund raising to support field projects and habitat preservation, and research, in addition to the critical aspect of population management.

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Species Survival Plans: Strategies for Wildlife Conservation

By Robert J. Wiese, Ph.D. and Michael Hutchins, Ph.D.

Softcover/64 pages/ over 80 photographs/Full Glossary/SSP Coordinators

Written in easily understandable language, highlighted with full-color photography shot around the world, this publication takes you behind the scenes of North American zoos and aquariums and introduces you to the new roles these institutions are playing in wildlife and ecosystem conservation. To address the changing aspects of animal care and husbandry over the last decade, zoos and aquariums have expanded their role to include the conservation of selected species. This book provides an in-depth look at the research, field studies and technology used by over 160 professionally managed zoos and aquariums in North America. This valuable resource will serve as an educational tool and unique reference for teachers, students, as well as zoo and aquarium personnel.

Cost of the publication is: \$15.00 for AZA Members/\$18.00 for Non-Members/ \$17.00 for Education/Libraries which includes s&h. Quantity discounts available. Payment in U.S. funds only made payable to AZA. Mail check or money order along with your name and complete mailing address to: AZA, Office of Membership Services, Oglebay Park, Wheeling, WVA 26003-1698, USA.

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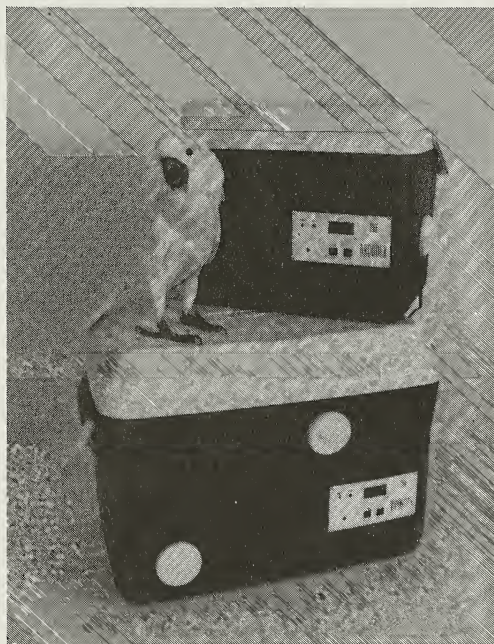
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The Role of the Zoo Keeper in AZA™ Conservation Programs

By Laurence Gledhill, Woodland Park Zoological Gardens, Seattle, WA

As an increasing number of zoo animals come under management programs the importance of the role of the zoo keeper has expanded tremendously. Today, zoo keepers are filling many positions in various American Zoological Association conservation programs ranging from keeper advisors to Species Coordinators. It is projected that within a few short years the total number of SSP® programs will increase from the eighty-two currently existing to approximately two hundred. With a normal management group size of ten individuals and an estimated fifteen institutional representatives per program the current numbers of 1230 representative positions will increase to three thousand positions. Concurrently, membership positions on the various management groups will increase from 820 to two thousand. Besides extensive programs such as SSP's, a new class of programs entitled "population management programs" are being established. These new programs will also significantly increase the number of individuals required.

A critical component of any SSP and PMP is an accurate, up-to-date studbook. Therefore, these management programs, will require 300+ studbooks and the individuals to maintain them. Curatorial and management staffs obviously cannot fulfill all these positions. Where will these additional individuals come from? The logical answer is from the zookeeper ranks. While many opportunities exist for keeper participation in conservation programs, this article will address the role of a zookeeper as a studbook keeper.

The arrival of computers and ISIS in the last few years has resulted in a complete metamorphosis in data collection but the basic requirements of a studbook keeper remain unchanged.

(1) The most important qualification is an intense (bordering on passionate) concern for and interest in the animal. Unfortunately I have seen individuals petition for a studbook based solely on their or their institution's desire to be involved with a studbook. A studbook requires an immense investment, especially in a person's time, and requires a tremendous dedication to the welfare of the animal by the studbook keeper.

(2) The second qualification is a willingness to devote an inordinate amount of time to the studbook. The studbook keeper is required to distribute the first edition of a studbook within 18 months (24 months for international studbooks) of approval and unless the subject has an extremely small population, compiling the data will require ten or more hours per week over the first eighteen months. An international studbook requires a larger investment of time but they allow twenty-

four months for the first edition. Very few keepers can devote this amount of on-duty time to a studbook project so they must be prepared to consign free time to the project until publication. After completion of the initial edition, maintaining the data current and distributing regular updates will require about four hours per week average.

(3) A third, and a very important requirement is a zoo administration that is willing to support you (both financially and time-wise) in this project. A basic requirement is attendance at the AZA™ Conservation Academy four day Studbook keeper training course. Currently this is held in St. Louis during February and will require the expenditure of funds for travel, lodging and tuition. Data collection will also require support in the form of postage, fax and telephone services in addition to allowing the actual time to complete the tasks.

The actual procedure of applying for a studbook can be found in the AZA™ Conservation Resource Guide. This is a complex process involving research into the animal and the necessity for a studbook. The application also requires statements affirming commitments detailed earlier.

As stated previously, data collection has changed completely since the arrival of ISIS and the widespread use of computers. When I began data collection for the Lion-tailed macaque studbook, I imputed the data into a computer but they maintained the information on paper records in most individual zoos. A central repository of information on individual animals or collection locations was unavailable at that time. Collection of data for the studbook entailed a considerable amount of correspondence such as when an institution would report obtaining an animal from a zoo. It was then necessary to contact the previous zoo to determine if it were born there or obtained elsewhere. If a birth was reported, learning the identify of the parents and their source was then necessary. I repeated this over and over until a data set was established and an overview of the population emerged. As a sidebar, the result of compiling this information for the Lion-tailed macaque studbook indicated that the five zoos responsible for 90% of the births worldwide had breeding males who were full brothers thereby creating a genetic disaster.

Today, a studbook keeper starts with a data disk containing the information submitted to ISIS. While this information is far from complete and cannot be considered as extremely accurate, it does give the studbook keeper a starting point. With this data the studbook keeper can printout the information in the database for each individual institution and send it to them for correction. The corrected information returned will form the basis for your initial studbook. Besides assembling the data for the studbook it will be necessary to compile a bibliography which can be an extensive but valuable task. The other main task involved is the studbook introduction which includes Systematics, Population Status, Distribution and Ecology.

Once the initial studbook is published and distributed it is time to sit back and



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relax, NOT. Keeping the information current is a continuing task. A studbook is a living document used on a daily basis in making management decisions and as such must contain the most relevant information possible. ISIS issues regular updates of information received in their office but the studbook keeper must maintain constant contact with the individual institutions. As most studbook keepers are also members of their respective Taxon Advisory Groups additional time and effort will be required for TAG activities.

Before the establishment of SSP® and SSP® type programs, studbook keepers were *defacto* managers of their studbook populations. With the advent of SSP® programs, studbook keepers converted to valued advisors to the management groups but abdicated their decision making role to the management groups. As studbooks are established for more species, it has become evident these species also needed some form of population management but not to the extent found in a SSP® program. It was with this scale of management envisioned that "Population Management Plans" are being established. In these programs studbook keepers will receive basic training in genetics, demography and population management which will enable them to make management suggestions to preserve the current population. It appears that history has made a complete circle again.

The question has been posed if I would again take on the task of assembling and maintaining a studbook and/or if I would recommend any other keepers to do the same. I look back on many hours and late nights sitting at the

desk when I would have rather been elsewhere.. I have faced the class system of being a "keeper" existing in a "management" domain but ignored it. I have been accepted during planning discussions but slighted when the meeting is over but I ignored it. Thankfully, these actions were primarily in the past, but they still do exist to a slight extent. I have been fortunate to be working in a zoo that is supportive of its keepers' activities. If acceptance is your desire, this is not the job for you. My personal satisfaction has come from a sense of accomplishment. I feel that I have contributed significantly to the conservation of the Lion-tailed macaque. In so doing I have attempted to provide a better environment globally and hopefully I'm leaving the planet in a better condition. Therefore, would I do it again and would I recommend another taking on a studbook? I would and do recommend it to you, if you and your institution meet the qualifications listed earlier.

North American River Otter Husbandry Notebook Available

A copy of this notebook has recently been sent to all ISIS institutions housing these animals. Chapters cover taxonomy, distribution, status, identification and description, behavior, social organization and natural history, reproduction, captive management, hand-rearing, diet, health care, behavioral enrichment, and a general bibliography. The volume is 129 pages. Anyone interested in purchasing a copy may do so for \$10.00 plus \$2.50 postage by contacting Jan Reed-Smith, John Ball Zoo, 1300 W. Fulton, Grand Rapids, MI 49504, (616) 336-4301. Checks should be made out to Jan Reed-Smith.

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How Species Survival Plans[®] Have Helped Change Animal Management

By

*Robert J. Wiese, Assistant Director, Conservation & Science
and Kevin Willis, Conservation Biologist
American Zoo and Aquarium Association, Bethesda, MD*

INTRODUCTION

The operation of zoos and aquariums has changed dramatically in the past 20-25 years. Although no one can say these changes would not have occurred otherwise, many of the changes have likely been spurred on by the increased emphasis on conservation and the initiation and operation of the AZA[™] Species Survival Plan[®] (SSP). Indeed many of the changes that have occurred were forecast explicitly when the SSP was initiated (Conway, 1980; Flesness, 1980; Meritt, 1980). Success of the SSP has depended on a continued and rapid change, and for the most part, AZA institutions have met the need for these changes.

Many of the changes result from a shift in focus from the individual animal to the population as well (Flesness, 1980). Once our focus is on the population we can no longer work within a single institution and mechanisms must be put in place for cooperation rather than competition. The most successful SSP programs have been those that share information openly and work well with one another sharing resources. Genetic and demographic management focuses primarily on the survival of the population for the long-term. This should ensure that more populations, some of which could not be reestablished from the wild, will endure. The population approach, however, also imparts health benefits to the individual animals due to decreased inbreeding depression. Healthier animals lead to decreased veterinary costs. The husbandry manuals, veterinary guidelines, standardized diets, enrichment protocols, etc. developed by the SSPs continue to focus on improving the animals' health and welfare. Below we highlight three important operational changes that have directly affected zoos and aquariums.

OPERATIONAL CHANGES

Increased Record Keeping

Record keeping is essential to the management of populations distributed among a number of institutions (Flesness, 1980). Record keeping has increased steadily since the formation of ISIS and the initiation of AZA approved studbooks. While ISIS participation is not mandatory, nearly all AZA institutions currently report data to ISIS at least once per year. AZA approved volunteers also maintain nearly 250 studbooks which document the more detailed records essential for population management (Flesness and Mace, 1988; Earnhardt et al., 1995).

Accurate records also enable more detailed veterinary, behavior, dietary, and other investigations which continually improve management techniques.

Increased Breeding Loans

In 1980 breeding loans were already increasing (Conway, 1980), but were far less common than today. For those institutions that depended on animal sales to meet their annual budgets, loans have meant a need to find new ways to generate income. Of course it has also meant that small institutions that could not afford certain species previously, now have the opportunity to contribute to the species' conservation. It is hoped that this monetary devaluation of SSP animals also has discouraged unnecessary collecting and profiteering at the expense of the species.

Increased Animal Moves

Increased movement of animals for breeding or for other program goals has decreased the number of animals that are born and spend their entire lives in one institution. As a result, staff and even the public which become attached to specific animals through daily contact often must say "good bye" to these animals for the benefit of the species. It is critical that all those affected by animal moves are provided an explanation of the move and the benefit the move will bring to the population. While a logical understanding of the benefit can help acceptance of the move, movement of special animals can still be a difficult emotional experience.

The tragic fire at the Philadelphia Zoological Gardens in December 1995 has highlighted some of the benefits of SSP participation and increased cooperation among North American zoos and aquariums. While the tragedy to the individual animals and staff can not be over emphasized, the impact to the affected North American populations was much less than it might have been. This is because the SSP can spread the population widely, so that a single institution does not hold too many of the most important animals. Also as an SSP participant, the Philadelphia Zoo will not have to toil alone to replace the animals which were lost. The SSP Coordinators will work with the zoo staff to replace the animals as quickly as possible. Without this now common level of cooperation within the zoo community, endangered species which were lost would be irreplaceable or at least very expensive to replace today. Through the now common breeding loans the Philadelphia Zoo can have animals on exhibit in a shorter period of time and for much less total cost than if this tragedy had occurred 15-20 years ago.

COMMON QUESTIONS ABOUT AZA SPECIES SURVIVAL PLANS

Why are endangered species with low population numbers ever recommended not to breed? Shouldn't we breed as many as we can?

Populations are recommended not to breed due to a demographic reality that adequate captive space is simply not available. Zoos and aquariums have limited space, personnel, and financial resources. If all resources are directed to one

species there will be none to assist other species in equally dire straits. Therefore, we must balance a population size that is large enough to remain viable and not so large as to exclude other species (Soulé, 1986). Also, gene diversity is decreased when some animals produce more offspring than others. In an effort to maximize gene diversity for the long-term survival of the population, some of the more prolific breeders must be recommended not to breed (Wiese and Willis, this issue).

Why are all breeding recommendations based solely on genetic factors?

This is a common misconception; AZA SSP breeding decisions do include other factors (Wiese and Willis, this issue). At one point in history genetics were not considered formally in making breeding decisions, except for the occasional desire to acquire unrelated bloodlines. This occurred in large part due to a lack of records as to who was related to whom among zoo populations. In the late 1970s concerns were raised about inbreeding problems in zoo populations (Ralls and Ballou, 1979; Flesness, 1978; Conway, 1980). This led to greater attention to genetics. The first SSPs focused breeding recommendations on minimizing inbreeding (Seal and Foose, 1983). However, for some programs the biological needs were sometimes ignored. Now SSPs consider genetics, demography, and husbandry equally to develop the best long-term plan (Hutchins and Wiese, 1991; Wiese and Willis, this issue).

How is culling used in captive management?

Few subjects raise such heated emotions as the discussion of culling (Lacy, 1991; Lacy, 1995). However, as managers we must recognize that culling may be the most responsible action in some instances. For example, culling is appropriate to relieve overcrowding that is jeopardizing the population or the well being of individuals when humane alternatives are not available. To minimize the need for culling, the AZA encourages limited, responsible breeding in SSP programs and actively supports contraception research.

Is genetic and demographic management really conservation?

Genetic and demographic management should be considered part of basic animal management the same as veterinary, dietary, or behavioral management (Wiese et al., 1994). Making good genetic choices when pairing animals for breeding or deciding not to produce more offspring than resources can support is essentially no different than choosing appropriate foods to maintain health. Genetic and demographic management is important to both the health of the individual and to the long-term health of the population. It is not how the population is managed that is conservation, but rather how the population is used to implement conservation action. Captive populations can affect conservation through preservation of gene diversity for future reintroduction, public and professional education, development and transfer of technology to the field, and fund raising to support habitat protection, parks, and reserves (Wiese et al., 1994; Hutchins et al., 1995).

Do institutions have to follow SSP recommendations?

Participation in SSPs is voluntary, but the key word is participation. SSP recommendations are made for the good of the population, and at times will conflict with the goals and exhibit needs of individual institutions. However, if institutions choose to participate only sporadically, the total plan will be weakened. Fortunately, the vast majority of SSP participants do put the needs of the population above the needs of their institutions. It is the responsibility of each institution to inform the SSP Coordinator of their goals and needs as well as individual characteristics of their animals that may make some recommendations unsuitable. If a recommendation does not make sense, you should contact the SSP Coordinator for an explanation. Quality control results from active participation by the institutions that must implement the plans.

How can I become more involved?

Zoo and aquarium keepers are contributing greatly to the success of the SSP and other aspects of the AZA Conservation Program. There are many opportunities for zoo and aquarium keepers to become active and even assume leadership roles in the AZA Conservation Program. The most obvious roles are Studbook Keeper, SSP Coordinator, or Management Group member. However, these positions require a prior written commitment by the individual's institution to provide sufficient time and financial support for the individual to complete their assigned tasks. Fortunately, many institutions make this commitment for keepers to become involved.

There are also opportunities to become involved without formal institutional support as Taxon Advisory Group members or as keeper advisors to the SSPs. These individuals volunteer for special projects such as fund raising, writing or editing SSP Husbandry Manuals, producing SSP Newsletters, compiling information on special topics such as enrichment, diet, etc. Individuals interested in making these commitments should contact the SSP Coordinator directly to see how they can assist.

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Want More Information?

FACT SHEETS on the following topics are available by contacting Robert J. Wiese, Assistant Director Conservation & Science at the AZA Executive Offices, 7970-D Old Georgetown Road, Bethesda, MD 20814-2493. Please send an address label.

- AZA Conservation & Science
- Species Survival Plan (SSP)
- Taxon Advisory Groups (TAGS)
- Fauna Interest Groups (FIGS)
- Scientific Advisory Groups (SAGS)

AAZK Announces New Professional & Contributing Members

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Understanding The Collection Planning Process

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Introduction

As conservation programs within the American Zoo and Aquarium Association (AZA™) mature, the need for the AZA to make recommendations to its members about their collection planning has increased. Following early work by the Crocodile Advisory Group in developing a collection plan that would increase emphasis on some species while advising against keeping others, one Taxon Advisory Group (TAG) after another has risen to the challenge, examining the conservation needs of their impacted species as well as polling AZA institutions to better define the interest level and number of "spaces" available for the various taxons. Although all faunal groups, mammals, birds, and poikiotherms, are involved in this analytical process, several mammal TAGs got an early start on this planning process because of the heightened degree of regulation placed on them by the United States Department of Agriculture, Interior, and Commerce as well as by various state and local regulatory agencies. This situation arose because mammals, unlike other groups of animals, are rarely brought into captivity from nature, and even their importation from captive-born sources in other regions of the world is both expensive and time-consuming.

The basic plan TAGs are charged with developing is known as the Regional Collection Plan (RCP). By following these plans, zoos will hopefully get the most "bang for their buck", emphasizing species within their collections whose populations in the wild are in peril and would thus benefit from nationally coordinated management plans while simultaneously meeting institutional exhibit and financial needs. In the process, many TAGs have been forced to move from an idealistic approach to a more realistic one that all levels of zoo staff can support. Although planning needs vary among mammalian Orders, most TAGs which have gone through a planning process have examined their species' conservation and legal status, specimen availability, exhibit and educational value, husbandry needs, founder size of the present population, and the likelihood that additional animals can be obtained from other regions or the wild. It makes little sense for TAGs to recommend species that few zoos are interested in, are able to keep alive, can financially afford, have very small founder sizes which are unlikely to ever be augmented from other sources, or for which we cannot maintain a self-sustaining population.

While all this sounds very logical and objective, the actual development of RCPs

has been anything but simple. Rather, RCPs will be living documents for the years to come, with later developing RCPs benefiting from the experiences of earlier ones. To help both other TAGs and AZA members better understand the planning process and its implications, experiences from the New World Primate TAG, Felid TAG, and Antelope TAG are offered for both their historical and educational value.

New World Primate TAG

As a group, primates are among the most popular mammals that zoos exhibit. And of all the primates, New World species are arguably the most abundant in captivity. Many species are small and easily managed and bred in captivity, a large number are rare and endangered in nature, and in the case of the golden lion tamarin (*Leontopithecus rosalia*) reintroduction programs have been underway for some time.

Because many New World primates are subdivided taxonomically into numerous subspecies or difficult-to-distinguish populations, the New World Primate TAG carefully censured zoos even as it considered their various conservation needs in order to evaluate available and potential cage spaces (Baker, 1994). This was deemed important not only because it is unrealistic to try and "save" all species in peril, but also because the reality of obtaining new specimens of endangered primates from range countries is such that many species are never likely to become involved in AZA management programs regardless of their conservation needs. Even when specimens are available, Centers for Disease Control-mandated quarantine requirements further complicate importation and raise the cost to the point that the importation of new species can only be supported by the TAG if all aspects of this action suggest success.

Once the number of captive spaces available in zoos were evaluated, this TAG, like the Monotreme and Marsupial TAG, came to the realization that there were a number of species which are abundant in both nature and captivity, or were represented in captivity by only a small number of specimens that had no long-term future. A number of studbooks or SSPs were already functioning for callithricids, which made evaluation of the overall population comparatively easy. Although some of the recommended programs would function better if managed globally, only four callithricids were identified for immediate SSP populations: golden lion tamarin (*Leontopithecus rosalia*), golden headed tamarin (*C. chrysomelas*), cotton-headed tamarin (*Saguinus oedipus*), and callimico (*Callimico goeldii*). Four other species were ear-marked for management as nucleus populations: Geoffroy's marmoset (*Callithrix geoffroyi*), Kuhl's marmoset (*C. kuhli*), emperor tamarin (*Saguinus imperator*), and Geoffroy's tamarin (*S. geoffroyi*) because of their potential for endangerment. The pygmy marmoset (*Cebuella pygmaea*) was added to this group because of the reality that zoos were going to keep them regardless of their widespread abundance in nature. In addition to the above recommendations, three other callithricids were identified as worthy SSP candidates if additional specimens were to become available from captive sources in South America bare-faced

tamarin (*S. bicolor bicolor*), white-footed tamarin (*S. leucopus*) and black lion tamarin (*L. chrysopygus*).] To make room for these high priority species, seven species have been recommended for phasing out, a recommendation that should be acceptable to most zoos, given the widespread availability and high exhibit quality of SSP or nucleus species.

On the basis of size, cebids were divided into three categories: small, medium and large. From there it was determined that four species were good SSP candidates: owl monkey (*Aotus lemurinus*), red-backed squirrel monkey (*Saimiri oerstedii*), black-capped capuchin (*Cebus apella xanthosternos*), and woolly monkey (*Lagothrix lagothricha lugens*). Ten other species were deemed suitable for nucleus populations, including: dusky titi (*Callicebus moloch*), white-faced saki (*Pithecia pithecia*), red uakari (*Cacajao calvus rubicundus*), black howler (*Alouatta caraya*), two species of spider monkey (*Ateles frontatus robustus* and *A. geoffroyi geoffroyi*), and all other woolly monkeys (*Lagothrix lagothricha ssp*). To make room for these cebids, the TAG has recommended that all other species of New World primates encompassing nine taxa be eliminated from AZA collection because of their low numbers in captivity and/or their general abundance in the wild.

While these recommendations incorporate more SSP and nucleus programs than space surveys suggest can be managed at this time, some of these programs will be international in scope and incorporate zoos in Europe or range countries. In other instances, SSP and nucleus programs are recommended for species not presently available, at least in any numbers. This TAG as well as the Felid TAG is also urging that zoos support *in situ* programs within range countries. In these ways, TAGs will have ways to make otherwise idealistic RCPs come to fruition while giving zoos sufficient time to alter their institutional collection plans.

One area that the New World Primate TAG was forced to address was official support of its recommendations. Although non-endangered primates may be imported from other regions without TAG support or knowledge, many New World species are endangered and highly regulated. As a result, TAG or SSP chairs, or studbook keepers, are increasingly being contacted by the U.S. Fish & Wildlife Service to verify that such an importation is justified. If no space, program, or increase in founder size is going to result from such an importation, cavalier importations will not be authorized by the government. In this particular instance, the importation of bare-faced tamarins (*Saguinus bicolor bicolor*) was challenged by the Office of Management Authority and only after the importing zoo and the TAG chair agreed upon the need and definition of the program was the application approved.

Felid TAG

The Felid TAG approached regional planning with the best of intentions because the family Felidae is extremely popular and has proportionately more endangered or otherwise regulated species than any other mammalian family

commonly held by zoos (Wildt et al, 1992). This TAG already has a number of SSPs in place, including ones for tiger (*Panthera tigris*), lion (*P. leo*), jaguar (*P. onca*), snow leopard (*P. uncia*), clouded leopard (*Neofelis nebulosa*), and cheetah (*Acinonyx jubatus*). Additionally studbooks are approved for six other species not presently managed by an SSP.

Regardless, it became readily apparent during the initial planning process that nine species of felids, African golden cat (*Felis auratus*), bay cat (*F. badia*), kodkod (*F. guigna*), Andean mountain cat (*F. jacobita*), Spanish lynx (*Lynx pardina*), Iriomote cat (*F. iriomotensis*), flat-headed cat (*F. planiceps*), Chinese desert cat (*F. bieti*), and marbled cat (*F. marmorata*) were not suitable for captive maintenance because they were not present in zoos and in most cases, were never likely to become available. An additional eight species, margay (*F. wiedii*), jaguarundi (*F. yagouaroundi*), leopard cat (*F. bengalensis*), jungle cat (*F. chaus*), Geoffroy's cat (*F. geoffroyi*), wild cats (*F. sylvestris*), Asian golden cat (*F. temminckii*), and pampas cat (*F. colocolo*) are present in such low numbers that barring large scale importations, would never be suitable for any kind of long-term program. Of these 17 species, over half are regulated by Appendix I of Convention on International Trade in Endangered Species of Wildlife Fauna and Flora (CITES) and/or the Endangered Species Act, further complicating any zoo's individual decision to proceed with importation plans unsupported by the TAG just because they were favorites of the staff.

The Felid TAG's biggest problem arose when it tried to select species for greater emphasis. Using a "Noah's Ark" approach, rusty-spotted cat (*Felis rubiginosa*), black-footed cat (*F. nigripes*), tigrina (*F. tigrina*), fishing cat (*F. viverrina*), Brazilian ocelot (*F. pardalis mitis*), Turkmenian caracal (*Lynx caracal michaeli*), sand cat (*F. margarita*), and Pallas' cat (*F. manul*) were recommended as the candidates best able to meet both conservation and exhibit needs of small felids. Unfortunately, the reality of specimen availability set in when zoos contacted the TAG for assistance in acquiring specimens from this list. It turned out that four of these eight species were not realistically going to be available in the foreseeable future, and that specimens of at least three of the other four species were best obtained from other regions if management efforts were to be meaningful. This realization was quite a blow to the TAG. Many zoos are financially or otherwise unable to import animals, even from locations in Europe, and at least for the short term, many small cats maintained by zoos of North America will have to represent species not recommended for long-term efforts. While TAGs must be responsible to the needs of the taxon, this lesson proved that its member constituents also have needs that are equally important. The most recent revision of the Felid TAG's RCP is an attempt to address these concerns and to be more "reality-based".

Antelope TAG

African and Asian antelopes pose serious academic questions for their TAG (W. Zeigler, pers. comm.). On the one hand, many species do well in captivity and have been widely held by both zoos and private owners for many decades. In

the case of blackbuck (*Antelope cervicapra*) and a few other species, free-ranging populations in North America are larger than those remaining in their original ranges. In other instances, antelopes have large ranges and numerous, often poorly defined subspecies. Because the origins of many species, particularly the larger ones, are now lost to posterity, the TAG's RCP was forced to target many taxa at only the species level. The only bright spot in this problem is the fact that many of the most commonly held and popular antelopes are common in nature and not likely to ever need reintroduction.

As with other TAG-managed groups, the Antelope TAG analyzed the number of spaces within the AZA, realizing too that many large private land owners may be available to assist in supplying additional specimens for a particular program, or in accepting species that are not recommended for long-term management by the RCP. Data from International Species Information System (ISIS) was particularly useful in providing insight into the number of taxa identified only at the species level versus the number whose owners separate them down to the subspecies level. After review, the TAG decided that for some common species, "lumping" all subspecies together was probably the most reasonable approach in the belief, as in the case of greater kudu (*Tragelaphus strepsiceros*) or sable (*Hippotragus niger*) that most specimens identified at the subspecies level in ISIS were of the same origin as those identified only at the specific level. In other cases, it was felt there would never be a reintroduction program, as in the case of common eland (*Tragelaphus oryx*) and that sub-specific purity was not an issue. In a few cases, there had already been some degree of mixing within range countries because of movement between private land owners and the subspecific purity of those wild populations may already be in jeopardy.

After several meetings, the Antelope TAG has come close to finalizing a plan that contains seven SSP® programs and 44 Population Management Plans (PMP). Those PMPs represent an ambitious number of programs, even though 33 of these 44 species underwent some degree of taxonomic consolidation. In addition, 23 taxa were earmarked for elimination because they do not need the effort or are unlikely to ever be available for importation. Regardless, the implications of this RCP are significant, given the scope of present antelope populations maintained in North America. To reach these objectives, many species will need additional genetic reinforcement from abroad. Even with the potential of relaxed Permanent Post-Entry Quarantine (PPEQ) regulation, the importation of non-native ruminants is a costly undertaking. This RCP, like that of the New World Primate TAG is several years away from fruition.

Conclusion

What do these RCPs have in common? To be successful, each RCP will need the support of all AZA members even as the TAGs come up with reasonable recommendations that each institutional member can and will want to meet. Also, each plan is a dynamic document, changing as new information becomes available. For individual institutions, it may also mean a reconfiguration of their collection. Although many zoos are trying to comply with the

recommendations of RCPs, the role of the dealer/importer has disappeared with time and zoos wishing to play a significant role in RCPs will have to assume that position. It may also require financial support of our members. These programs will require more people to direct the programs just as surely as additional animals will be needed from other regions. Hopefully all our members will respond to this call, and the sooner the better.

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FELID ACTION PLAN, 1991 AND 1992. AAZPA Felid
Taxon Advisor Group Regional Collection Plan and IUCN
Captive Breeding Specialist Group Global Felid Action
Plan. Conservation and Research Center, Front Royal, VA.
205 pp.

Information Please

Can anyone provide us with information about successful infant formulas they have used to hand-rear baby kinkajous (*Potos flavus*) rejected by their mothers? Please write to: Beverly Tessler, Thousand Islands Zoo, 42240 County Route 21, Redwood, NY 13679, or call (315) 628-5821.

I am looking for information regarding the breeding habits of tri-colored squirrels (*Callosciurus prevosti*). I have been searching for information regarding this subject and have found little about it, so I would greatly appreciate any information. We hope to increase the breeding success of our 1.1 tri-colored squirrels. Please send any information to: Laura Taylor, Sedgwick County Zoo, 5555 Zoo Blvd., Wichita, KS 67212.

We just had a Prehensiled-tailed skink (*Corucia zebrata*) donated for exhibit purposes. Any information on keeping this species would be greatly appreciated. Information on diet, enclosure design, temperature and humidity requirements, sexing, reproduction and natural history would all be of great interest. Please contact Michele Smith, The Pueblo Zoo, 3455 Nuckolls Ave., Pueblo, CO 81005.

Legislative Update

*Compiled by Georgann Johnston
Legislative Advisor
Sacramento, CA*



Mountain Lion May Lose Protection in California

The voters of California will have a chance in March 1996 to legalize sport hunting of cougars, also known as mountain lions. If passed, the law would repeal Proposition 117, passed by California voters in 1990, which continued a ban on sport hunting of cougars instituted in 1972.

Proponents of the law say that mountain lions have become a threat to humans - citing the deaths of two people in the past year. Opponents of the proposition say that the existing law already allows the California Department of Fish and Game to hire professional hunters to kill mountain lions to protect livestock and humans. This controlled hunting would eliminate only those animals which have proven themselves to be an actual risk to people or property. There were 130 mountain lions killed by F&G hunters in 1995.

One problem with reopening hunting of the mountain lion is that the F&G Department cannot even say how many of the animals are left in the wild. In 1991 there were 59 sightings in the state and there were 300 sightings in 1995, but many of the 1995 sightings were unverified by Department procedures. The Department estimates that there are between 3000 and 6000 of the animals left and the proposition regarding hunting would not place any limit on the number of mountain lions taken per year.

Source: Oakland Tribune, 23 October 1995

Canada Passes Legislation to Reduce Illegal Wildlife Trade

The Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA), which was scheduled to take effect in the fall of 1995, proposes to add an additional grounds for enforcement of illegal wildlife trade violations. Canada is a signatory to CITES but illegal wildlife trade continues to be the second highest cause of species decline in the country, right behind habitat destruction.

Until now, CITES has been enforced under the Canada Export and Import

Permits Acts through Revenue Canada Customs (RCC). conservationists have complained that not enough monitoring occurs within the country's borders and that the RCC devotes too much of its efforts towards drug trafficking and not enough to the wildlife trade.

The Canadian Wildlife Service (CWS) will be responsible for coordinating WAPPRIITA enforcement. Conservation officers of the CWS have found black bear carcasses in the wild with only their gall bladders and paws missing. Bobcats, cougars and lynx have also been killed to supply the Asian black market demand for traditional medicinal ingredients. This legislation will allow poachers to be charged with violation of the Act and fined between \$5,000 and \$25,000 or sentenced to prison for up to five years, depending on the nature of the offense.

Source: University of Waterloo Alternatives Magazine October 1995

Mexican Gray Wolf to be Reintroduced to Arizona and New Mexico

The critically endangered Mexican gray wolf (*Canis lupus baileyi*) is the subject of a reintroduction proposal put forth by the U.S. Fish and Wildlife Service (USFWS). The proposal, first presented in late summer 1995, is now in the public comment period and a final decision and plan is expected in early 1996.

Only 137 Mexican gray wolves are known to exist today and all of these are being held in 24 zoos and other wildlife conservation facilities in the United States and Mexico. While it is possible that some members of the species remain in the wild, the last confirmed sighting was in 1980.

The reintroduction plan includes two geographically distinct areas of the wolf's original historic range. One is the White Sands Wolf Recovery Area in south-central New Mexico and the other is the Blue Range Wolf Recovery Area in the Apache and Gila National Forests of Arizona and New Mexico. If both areas are approved for use, USFWS estimates that 120 wolves could range across the approximately 6000 square miles of public lands.

Opponents of the plan have raised the issue of livestock depredation. In response, a private organization, Defenders of Wildlife, has stated a willingness to extend an already existing compensation program to pay full market value for any documented livestock losses caused by Mexican wolves.

Further information about the proposal may be obtained from Wendy Brown, FWS Mexican Wolf Recovery Program, Albuquerque Regional Office, P.O. Box 1306, Albuquerque, NM 87103, (503) 248-6282.

Source: Endangered Species Bulletin, Sept./Oct. 1995, published by the U.S. Department of the Interior

Genetic, Demographic, and Biological Considerations in Making Species Survival Plan[®] Breeding Recommendations

By

*Robert J. Wiese, Assistant Director, Conservation & Science
and Kevin Willis, Conservation Biologist
American Zoo and Aquarium Association, Bethesda, MD*

INTRODUCTION

When zoo and aquarium personnel are asked to explain the AZATM Species Survival Plan[®], many will mention "breeding recommendations" as their first response. Although SSPs have evolved to include many other aspects as well, breeding recommendations remain one essential part. In North America, SSP breeding recommendations are based primarily on the population's genetics and demographics, the species' biology and husbandry, and logistics. Occasionally politics still pokes its ugly head into the picture; fortunately this is declining as the SSP becomes more scientifically based.

Scientifically based breeding recommendations for captive populations have received wide acceptance in zoos and aquariums as an essential element of responsible animal management (Wiese et al., 1994). So wide has been this acceptance that the AZA Wildlife Management and Conservation Committee (WCMC) approved the concept of Population Management Plans for all species covered by studbooks including non-SSP species. Whether for SSPs or studbook species, breeding recommendations are based on the same criteria described below. The difference between the two is that SSPs can adhere to the criteria more rigorously because institutions have agreed beforehand to abide by the recommendations for the benefit of the species.

GENETIC CONSIDERATIONS

In the early 1980s Species Survival Plans made breeding recommendations based on minimizing inbreeding (Flesness, 1978; Seal and Foose, 1983). Early SSPs also attempted to preserve 90% heterozygosity (a measure of genetic variation lost due to inbreeding) for 200 years as a genetic reservoir in case reintroduction was required (Soulé et al, 1986). Unfortunately, many people mistakenly believe the AZA breeding programs continue to pursue these same goals. Management to avoid inbreeding is a short-term strategy and can lead to increased inbreeding in the long-term if founder allele frequencies are not equalized early in the breeding program (Ballou and Lacy, 1995). With the development of new methodologies, the Species Survival Plan changed to a breeding strategy using mean kinship to make breeding recommendations in

1990. This strategy maximizes a measure of genetic variation termed “gene diversity” (Weir, 1990), rather than observed heterozygosity (1-inbreeding) by equalizing the frequency of founder allele frequencies to the extent possible. Maintenance of gene diversity in the population decreases inbreeding in the long-term and also results in lower long-term levels of adaptation to the captive environment (i.e., domestication).

An animal’s mean kinship value is a measure of its relatedness to all other animals in the population. If an animal has a high mean kinship the animal has many relatives and the alleles it carries are common in the population. A low mean kinship indicates few relatives and alleles that are rare in the population (Ballou and Lacy, 1995). Mean kinship is used to prioritize the animals, with preferential breeding for those with rare alleles, and identifies potential mates as those animals carrying alleles of roughly the same frequency.

Animals with rare alleles should be paired with animals that also have rare alleles. In this strategy, animals with rare alleles and their offspring are bred more to equalize the frequency of their alleles in the population. Breeding animals with rare alleles to animals with common alleles couples the rare and common alleles in their offspring. This greatly reduces the manager’s ability to use these offspring to equalize the population’s allele frequencies in the future. This is why proven breeders that have many offspring are not paired with new wild-caught animals that possess relatively rare alleles. At one time this was a common practice because these matings do not produce inbred offspring.

A breeding strategy that pairs animals based on mean kinship and preferentially breeds those animals with low mean kinship values will maximize gene diversity, minimize long-term inbreeding, and maintain the allelic frequencies captured in the founders. Note that while long-term inbreeding will be minimized, short-term inbreeding may actually be promoted to increase the frequency of certain rare alleles.

The factor which most drastically reduces gene diversity in small populations is unequal family size. Gene diversity is maximized when all founder allele frequencies are equal. Thus, if animal A has many offspring, while other animals have few offspring, the alleles from animal A will increase in frequency relative to the others. A difference in sex ratio can lead to the same skew in allele frequency. This is the primary reason that successful breeders are often recommended not to breed and males are rotated out of breeding situations in herd species.

Fluctuating population size can also reduce gene diversity. Therefore, SSPs attempt to maintain stable, slowly breeding populations. For smaller populations, long lived species, and species with large litter sizes, this strategy requires that the majority of animals are not reproducing in any one year. As a result participating institutions must hold nonbreeding animals more often than breeding animals. However, holding nonbreeding and breeding animals is equally important as both are necessary for the long-term success of any SSP.

Importation of wild-caught or unrelated animals from other regions can boost the population's gene diversity. However, it is very important how the new gene diversity is incorporated into the population (Willis and Wiese, 1993). Elimination of overrepresented animals by exportation or culling can also help maximize gene diversity by reducing the frequency of the more common alleles in the managed population.

DEMOGRAPHIC CONSIDERATIONS

At the most simplistic level, demographic considerations required to maintain a stable, self-sustaining population involves managing births to equal deaths. For Species Survival Plans this is accomplished preferably by limiting breeding, which is less controversial than manipulating death rates. However, as with wild populations under restricted resources (e.g., deer, elephants) culling is an effective management strategy. Culling may be necessary if excess births jeopardize the quality or success of the entire population, especially for species with large litter sizes (Lacy, 1991; 1995). To minimize the need for culling, the AZA continues to promote and invest in the development of effective contraceptive methodologies. As a program progresses, death rates decrease and birth and survival rates increase through veterinary, dietary, and husbandry developments. This leads to an increasing need for greater attention to demographic control.

In an ideal world, zoo and aquarium populations would all be very large and thus less sensitive to demographic concerns. However, captive space and other resources are limiting (Meritt, 1980; Hutchins et al., 1995). Therefore, we must attempt to keep populations large enough to maintain sufficient gene diversity and to guard against dramatic declines in population numbers. However, at the same time, we must not use excessive space for any one species as that will reduce the available resources for other species (Soulé et al., 1986).

Demographic concerns are most acute, and receive the most attention, when the captive population is very small. For the smallest populations, those under 20-30 individuals, demographic concerns must often outweigh genetic considerations when making breeding recommendations. Demographic concerns can also take precedence when a population is skewed heavily toward older animals with little reproduction in recent years. This can be the case for species which historically have bred infrequently. In these instances, it may be necessary to increase the population size quickly and later attempt to address skewed genetic representation. While this is an appropriate strategy to maintain the captive population, it often results in a greater loss of gene diversity. Some of the lost gene diversity can never be regained once animals are bred without regard to genetic status.

SPECIES SPECIFIC BIOLOGICAL CONSIDERATIONS

Early Species Survival Plans focused primarily on genetic and demographic

criteria to make breeding recommendations. As a result some of the species' biological needs were not always given adequate consideration. Since 1991, there has been an increased effort in SSP programs to consider the behavioral, dietary, enclosure, social, veterinary and other needs of the animals (Hutchins and Wiese, 1991). A few typical concerns that must be considered along with the genetics and demographics and examples of each are discussed below.

(1) *Species with behavioral difficulties in captivity.* Clouded leopards should to be paired when less than one year of age to reduce the probability of the male killing the female. With only a few leopards born each year, the number of pairing options is greatly reduced. This behavior also makes repairing animals difficult and dangerous. Thus, less than perfect genetic pairs remain together rather than risk death of the female during repairing.

(2) *Species requiring specific social situations.* Many taxa live in family or other social groups in the wild. If these conditions are to be replicated for the animals' well-being and for educational purposes, genetic and demographic conditions must be relaxed slightly. Also, it may be difficult to introduce the best genetic match into the current social situation, so an alternative must be accepted. Cotton-top tamarins provide another example of social requirements. To be successful parents cotton-top tamarins must have experience raising younger siblings. Thus, offspring must stay with their parents longer, reducing the potential pairings that would otherwise be possible based on genetics alone.

(3) *Species managed in herds or flocks.* Mammals that live in herds can be a challenge because a single male can make his lifetime reproductive contribution in a single year by impregnating all females in a herd. Males can be rotated through herds to reduce male-male fighting, but this necessitates a place to hold the extra males until and after they are required for breeding. Flocks of birds (e.g., penguins) which are multimale and multifemale can be an even greater challenge. In these cases the manager must assemble a flock such that any possible breeding that occurs will be relatively good; essentially flocks in which all animals have similar mean kinship values. An effort to avoid the worst pairs will usually mean that the best pairs can not be formed either.

(4) *Species requiring mate choice.* Micronesian kingfishers have been difficult to breed in captivity. A recent change in the SSP's approach is to allow mate choice in the hopes of spurring reproduction. This will require participating institutions to hold several pairs of kingfishers to maximize the number of pairing opportunities within an institution. This was important because stress during transfers was identified as a significant mortality factor. Therefore, although species requiring mate choice may not herd or flock, they need to be managed in a similar way by making sure that any pair that reproduces will not be a detriment to the population.

(5) *Species with short reproductive periods.* Female black-footed ferrets are reproductively receptive for only a few days each year. If the best male is not reproductive, or not interested, there is little time to select an alternative male.

Therefore, the SSP arranges the ferret population such that each female is at the same institution as three potential mates. If the primary match is not successful, the second and then third alternatives will be tried, but all alternatives must be relatively good genetic matches.

SUMMARY

To scientifically manage captive populations for conservation and long-term survival, breeding recommendations must be made for the population as a whole. This requires that all institutions give up a little of their own control for the benefit of population and the species. Aspects of genetics, demographics, and the species' biology must be considered. Consideration of these various influences necessitate a compromise between them in order to get the best comprehensive plan. As a result any one recommendation in an SSP Master Plan or Population Management Plan considered alone may not make sense in terms of genetics, demographics, or the species' biology. However, when considered as part of the whole plan, each breeding and nonbreeding recommendation works together for the benefit of the population.

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A BRIEF HISTORY AND STATUS OF THE AMERICAN ZOO AND AQUARIUM ASSOCIATION'S GIANT PANDA ACTION PLAN

*By Sydney J. Butler, Executive Director of
the American Zoo and Aquarium Association*

The American Zoo and Aquarium Association (AZA™) has long been concerned about the survival of the critically endangered giant panda ("panda"). This concern produced an ongoing moratorium on the importation of pandas, legal actions, policy statements and more recently the adoption of an overarching Giant Panda Action Plan ("Plan"). The following discussion focuses on this important Plan.

Background

Between 1984 and 1992, no fewer than 11 AZA member institutions exhibited pandas under short term loan agreements with China. The exhibitions drew enthusiastic crowds, along with controversy about the display and "commercialization" of an endangered species. There was also concern during this period that the loans were inadvertently contributing to unnecessary removals of pandas from the wild. This concern and controversy led the AZA Board in 1990 to impose a moratorium on giant panda acquisitions in the absence of a responsive conservation strategy and plan.



By the end of 1992, however, there were positive signs regarding panda conservation. Chinese authorities had approved a National Conservation Management Plan For the Giant Panda and Its Habitat, established a Studbook, and were indicating an interest in long term breeding loans. These positive actions, coupled with the increasingly precarious status of pandas in the wild and in captivity, convinced AZA that an aggressive and coordinated plan was warranted.

At its 1993 mid-year meeting in Santa Barbara, California, the AZA Board decided to reaffirm its existing moratorium on the acquisition of giant pandas for short term exhibition loans. However, with respect to long term breeding loans, the Board voted to initiate an active conservation strategy, fully coordinated with the efforts of the Chinese authorities and other concerned conservation organizations. This new strategy was designed to improve both *in situ* and *ex situ* conservation efforts. The Board believed that, in addition to *in*

situ efforts, captive breeding played a vital role in the conservation of pandas, and that cooperative action had to be taken if pandas were to be saved from extinction. As a direct result of this Board action, the Plan was conceived and crafted into a formal document.

Goals and Key Provisions of Plan

The *primary goal* of the Plan is to maintain a self sustaining population of pandas in nature. More specifically, the Plan aims to create a unified voice for the North American zoological community, to avoid individual or uncoordinated initiatives, and to assist the Chinese authorities in their efforts to effect specific conservation actions on behalf of pandas.

The *key provisions* of the Plan include:

1. Creation of a formal and binding structure for the North American zoological community to speak in a unified voice for panda conservation;
2. Development of a Giant Panda Species Survival Plan (SSP©) including selection of a Species Coordinator and a Propagation Group;
3. Establishment of an accountability structure which requires that any institution seeking panda breeding loans provide agreements which assure that payments will fund specific *in situ* and *ex situ* conservation projects. Payments and projects are to be monitored by a Plan Coordinator;
4. Funding of priority actions including, for example (a) employment of a full time Plan Coordinator; (b) travel and other expenses of an SSP Coordinator and for negotiating delegations to/from China; (c) initial investments in conservation projects, and (d) development of a Global Captive Management Plan, establishment of an SSP-like management plan in China, and initiation of a technology and training transfer program linking zoo professionals in husbandry, management and health care;
5. Agreement that all pandas received for breeding loans shall be captive bred, held in captivity as of March 1, 1993, or determined on a case by case basis by the SSP Propagation Group and the AZA Board to have been obtained by legitimate rescue operations.

The Plan has several other important provisions, all of which are agreed to by participants who sign a formal Memorandum of Participation. The Plan is managed by an Executive Committee generally responsible for overseeing negotiations of panda loan agreements and placement of pandas in North America. In addition, the Plan has established a Giant Panda Conservation Foundation with responsibilities to generate funds and oversee a multi-million dollar/ten year funding plan to carry out *in situ* and *ex situ* conservation programs in China.

As in any AZA SSP effort, the Plan is driven by scientific research, and has

specific housing and maintenance guidelines. Planning is also underway to develop an international education component.

Current Status

The Plan is supported formally and financially by 22 AZA institutions. In addition, by virtue of the AZA Board's adoption of the Plan, the Plan represents the current policy of AZA and applies to all of its members.

Many of the priority actions identified in the 1993 Plan have been accomplished. AZA members are unified behind a precise, well crafted Plan, and are speaking with one voice in negotiations with the Chinese. A Project Coordinator was employed, an SSP Coordinator was chosen, AZA conservation and science personnel have trained Chinese counterparts in SSP management, negotiating teams have visited China on several occasions, and substantial funds have been invested in both *in situ* and *ex situ* efforts in China (funds for reserve management, construction and equipment, for example).

An offer for significant conservation funding has been made to Chinese authorities, as part of the establishment of a North American breeding population of pandas. The funding would extend over at least a ten year period, to support conservation projects identified by the Chinese and acceptable to Plan members. This funding offer, which includes a long term research loan approved for San Diego by the U.S. Fish & Wildlife Service (USFWS), is still being considered by the Chinese.

On a related national policy issue, the Plan has gained substantial respect with the USFWS, which recognized the Plan as a significant factor in a proposed new panda importation permit policy. That policy is in the final stages of adoption by the Service.

Conclusion

The AZA Giant Panda Action Plan is a carefully planned and well funded conservation commitment by AZA and its members. Following the successful SSP format, the Plan binds participants to clear responsibilities regarding captive breeding loans, while at the same time structuring an enormous opportunity to infuse substantial funds into *in situ* and *ex situ* efforts in China. It has earned the respect of governmental policy makers, and has demonstrated an extraordinary commitment by the North American zoological community to assist international colleagues in conserving an extraordinarily visible and critically endangered species.



AMERICAN ZOO AND AQUARIUM ASSOCIATION

Keeper to Keeper - Getting Involved With SSP "Husbandry Manuals"

By Judie Steenberg, Woodland Park Zoological Gardens, Seattle, WA

Back in the 1970's, when SSP's were being "talked about", and again in the early 1980's when they actually became a reality, I asked Dr. Ulysses Seal what a Keeper could do to help with Species Survival Plans® (SSPs). His advice was to learn all I could about a species, especially about their husbandry. My next question was.....which species should I concentrate on? Dr. Seal's answer was that one day we would find ourselves concerned with the careful management of all species in zoological facilities.....that day has come.

Even those species not currently managed under the auspices of an SSP® are of concern to us since they represent "spaces" As the zoo profession moves more and more toward the conservation of endangered and threatened species, careful management of the entire zoo collection and utilization of resources must be considered. We no longer have the luxury of waiting to see what happens; time has become a critical element in our long range planning.

One requirement for being on an SSP, in any capacity, is the written approval of an Institution's Director. Keepers currently serve as SSP Institutional Representatives, Studbook Keepers, SSP Coordinators, Management Group Members, as well as Authors and/or Editors of Husbandry Manuals. The Orangutan SSP was the first to include a Keeper Advisor position in their Management Group, and should be commended for doing so. If you are interested in becoming involved in a particular SSP, discuss your interest with your Director and SSP Institutional Representative. Find out how you can become involved.

Meanwhile, as a Keeper of an SSP animal you have the very basic task of knowing all there is to know about a species. This means researching literature, discussing problems with colleagues, and knowing what is normal versus abnormal for the species, and individual animals. You should be in touch with your Institution's SSP Representative, know the name of the SSP Coordinator and the status of the SSP. You should be aware of, and understand the reasons for SSP recommendations for pairing and breeding, or NOT breeding individual animals. If a Master Plan has been prepared, read it and seek answers to any questions you have.

At this point I'd like to acknowledge a problem that was brought to my attention several times while I was the Tree Kangaroo SSP Coordinator.....Keepers do not always have ready access to information and documentation as mentioned above! In fact, in one major zoo, Keepers must be supervised when using the library. It's difficult for me to imagine that this lack of information sharing is still going on, but it is. From one Keeper to another, I'd like to encourage you

to continue making an effort to become informed, and gently persevere when you meet with roadblocks. Don't wait to be given information, seek it out.....show initiative, get involved.

Husbandry is one of three essential elements in managing a captive population. In the AZA™ Conservation Academy's SSP Coordinator Training Course Husbandry has been given equal status with Genetics and Demography in managing an SSP program. All SSPs are required to compile a Husbandry Manual. SSP Coordinators are provided with "Guidelines for The Contents of AZA Husbandry Manuals" to develop these manuals. The general categories to be included in Husbandry Manuals are: Housing and Enclosure Requirements, Management, Behavior and Social Organization, Reproduction, Hand-rearing, Nutrition, Health and a Bibliography.

If there is a "Husbandry Manual" for the SSP animal(s) you are working with, review it carefully, and provide feedback if warranted.....If there is NOT a Husbandry Manual, this is your opportunity to become directly involved in a very meaningful and important way. However, before taking on this task you must understand that this is a serious commitment that will probably require much more time than you first envision. Evaluate your personal situation before getting involved at this level. Ask your SSP Institution Representative to see the "Guidelines for the Contents of AZA Husbandry Manuals" for a more detailed breakdown of each category, and a better idea of what all goes into a Husbandry Manual. There is also an instruction sheet on AZA Husbandry Manual format.

It's my belief that the most logical people to be involved with writing a Husbandry Manual are those directly involved with the daily care and management....namely the Keepers.

SSP Coordinators are responsible for seeing that Husbandry Manuals are prepared, but they can be written, and compiled by one or more authors and editors. Each SSP decides how it will undertake the task of writing a Husbandry Manual. For example, the original "Tree Kangaroo Husbandry Notebook" (TKHN) was compiled by three Woodland Park Zoo Keepers. The TKHN is now being updated and revised, according to AZA Guidelines, by several authors including Keepers, Curators, Veterinarians and Nutritionists.

Not every Keeper can be directly involved with compiling a Husbandry Manual. However, the work you do on a daily basis can be an important contribution. This is especially true in how well you keep your records. All Keepers should be keeping the best records possible on all of the animals, but especially SSP species. Go back to the general categories listed for a Husbandry Manual. Think about the data you record and how it can provide useful information for future reference. This is especially relevant if there is a lack of information for a species in certain aspects of management, such as reproduction, life history characteristic or the developmental milestones of offspring. Good records are an excellent source of information for surveys and husbandry manuals.

Other information you could supply for a Husbandry Manual might be:

- A special expertise you have or information about a unique circumstance.
- Specifics about particular animals, such as aberrant behavior.
- Problems you have encountered, and solved.

While we were compiling the Tree Kangaroo Husbandry Notebook a wealth of information came from Keepers experienced in caring for tree kangaroos. Often the experience of one Keeper was validated by the same, or similar, experience of another Keeper. For example, reports on several incidents of aggression by tree kangaroos toward other species brought to light the problem of mixed species exhibits. This information provided a valuable reference for others to consult when considering tree kangaroos in a mixed species exhibit. Various institutions reported tree kangaroos had killed and eaten birds, harassed other mammals and/or pursued water dragons. This information came from Keepers' records. Each individual incident didn't appear to be especially significant. Yet when the information was collected and it became apparent that there is a definite risk in keeping tree kangaroos in mixed species exhibits.

The Tree Kangaroo Husbandry Notebook preceded the Tree Kangaroo SSP (TK-SSP) by about three years. It was an invaluable source of information, especially to institutions wanting to add tree kangaroos to their collections. The TK-SSP, established in November 1991, has steadily forged ahead and now has a Five-Year Action Plan with an *in-situ* conservation component. And yet, what we have accomplished in the captive management of tree kangaroos was based on improving husbandry standards, and sharing that information with the worldwide zoological community.

An SSP will only be successful with sound husbandry practices. The best way to share our collective knowledge about a given species, based on years of experience, is with a Husbandry Manual. A good Husbandry Manual requires that everyone work together to make it as complete and useful as possible, for the benefit and future of the animals in our care. The importance of Husbandry cannot be overstated; it precludes the genetic and demographic management of a species. Without a healthy, well managed collection, capable of reproducing sound, healthy offspring, the genetics and demography of a species can become irrelevant. I would encourage you to become involved at the Husbandry Manual level if at all possible.

In closing I'd like to quote AZA Conservation Academy Instructor, Jill Mellen, "Genetic and demographic analysis of a population provides long-term breeding goals. However, the bottom line to such a plan is (obviously) the maintenance and propagation of individuals within that captive population." That's what our job is all about, and then some.

AZA Species Survival Plans© June 14, 1995

Mammals (52 programs/59 species)

Addax
African Wild Dog
Arabian Oryx
Asian Small-Clawed Otter
Asian Wild Horse
Babirusa
Barasingha
Black Lemur
Black Rhinoceros
Black and White Colobus
Black-footed Ferret
Bonobo
Chacoan Peccary
Cheetah
Chimpanzee
Clouded Leopard
Cotton-top Tamarin
Drill
Elephant (Asian and African)
Gaur
Goeldi's Monkey (Callimico)
Gibbon (Siamang, White-cheeked,
White-handed)
Giant Panda
Golden-Lion Tamarin
Greater One-horned Asian Rhinoceros
Grevy's Zebra
Hartmann's Mountain Zebra
Jaguar
Lions
Lion-Tailed Macaque
Lowland Gorilla
Maned Wolf
Mangabey
Mexican Gray Wolf
Mongoose Lemur
Okapi
Orangutan
Pygmy Hippopotamus
Pygmy Loris
Red Panda
Red Wolf
Ring-tailed Lemur

Rodrigues' Fruit Bat
Ruffed Lemur
Scimitar-Horned Oryx
Snow Leopard
Sloth and Sun Bears
Spectacled Bear
Sumatran Rhinoceros
Tiger (Siberian, Sumatran)
Tree Kangaroo (Doria's, Goodfellow's,
Grizzled, Matschie's)
White Rhinoceros

Birds (14 programs/18 species)

African Penguin
Bali Mynah
Cinereous vulture
Condos (Andean, California)
Congo Peafowl
Crane (Hooded, Red-crowned, Wattled,
White-naped)
Greater Hornbill
Guam Rail
Humboldt Penguin
Micronesian Kingfisher
Palm Cockatoo
Pink Pigeon
St. Vincent Parrot
Thick-Billed Parrot

Reptiles and Amphibians (7 programs/7 species)

Aruba Island Rattlesnake
Chinese Alligator
Cuban Crocodile
Dumeril's Ground Boa
Puerto Rican Crested Toad
Radiated Tortoise
Mona/Virgin Islands Boa

Fishes (1 program/34 species)

Haplochromine Cichlids
(34 species)

Invertebrates (1 program/4 species)

Partula (4 Species)

Total:

**75 Species Survival Plans (SSPs)
122 species covered**

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.; 1-800-468-1966 (Canada). Our FAX is 913-273-1980.

The following two (2) positions are available at Six Flags Magic Mountain, P.O. Box 5500, Valencia, CA. Follow instructions for applications under each position.

ANIMAL CARE COORDINATOR...requires degree in animal management related field and experience in the care, handling, training of wild and exotic animals; two years supervisory experience with excellent oral, written and interpersonal skills. Presentation skills and/or previous experience with outreach or educational programs desired. Responsible for daily animal care, observations, exhibit maintenance, staff supervision, and public contact. Send salary history/resumé to Human Resources, Attn: Animal Care Coordinator at the address above or call (805) 255-4770 for more information.

ANIMAL CARE SPECIALIST SUPERVISOR...requires two years of college level course work, two years experience in the care, handling, training of wild/exotic animals. Excellent presentation skills and experience with outreach or educational programs. Must be an outgoing individual who is able to motivate/supervise others and work as a team member. Please send resumé to Human Resources, Attn: Animal Care Specialist Supervisor at address above or call (805) 255-4770 for more information.

SEABIRD/FALCON KEEPER I (POSITION #10251)...prefer a four-year degree in animal-related science field, and a minimum of one year of experience with birds in a zoo setting. Scuba certification also preferred, but not required. Responsibilities include the care and maintenance of the seabird exhibit (Horned Puffins, Parakeet Auklets, and Thick-billed Murres) and the Peregrine Falcon exhibit. Please send resumé/references with position number **by 23 February 1996** to: North Carolina Zoological Park, c/o Cami Bunting, Human Resources, 4401 Zoo Parkway, Asheboro, NC 27203.

ZOOKEEPERS -Psittacines...requires minimum of one year paid, hands-on experience with macaws and degree or equivalent zoo-related experience. **Mammals**...requires minimum of one year paid, hands-on experience with ungulates and felines and degree or equivalent zoo-related experience. Duties for both positions include daily care, feeding, habitat upkeep, breeding programs, record keeping, medical coordination, training, acquisitions, supervising part-time staff/volunteers, and presenting educational programs, etc. Must be willing to work weekends/holidays. Starting salary \$15,000 - \$20,000 with year-end bonus and benefits. Excellent growth potential. Salary commensurate with

experience. Send resumé/references to: Washington Zoological Park, 19525 SE 54th, Issaquah, WA 98027. FAX (206) 392-1076. Positions open until filled.

BIRD CURATOR...responsible for the management and development of collection. Must be able to supervise staff, communicate effectively and be team oriented. Will report directly to the Executive Director. Requires Bachelor's degree in zoology or ornithology or a closely related field, plus five (5) years experience in aviculture. Experience in supervision, development and maintenance of a facility and animal records necessary. Salary commensurate with experience. Send letter, resumé and three (3) references and salary history to: Marlayn Cragun, Tracy Aviary Curator Search, 1965 West 400 South, Salt Lake City, UT 84104. Inquiries should be directed to Board President, Laura Lockhart (801) 536-8278.

FULL TIME REPTILE KEEPER...the Miami Valley Serpentarium, a nonprofit organization, is seeking a full-time reptile keeper. MVS is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The position will be in charge of the captive maintenance of the zoo's reptile collection, they will give interpretive talks and interact with the public, supervise the educational outreach programs, supervise interns and part-time staff and perform other duties as assigned. Starting salary is \$7.00 per hour. To apply send a cover letter and resumé to: James R. Harrison, Executive Director, MVS Reptile Zoo/Captive Born Venoms, 1275 Natural Bridge Road, Slade, KY 40376. Deadline for applications is **1 March 1996**.

INTERNSHIP...the Miami Valley Serpentarium, a nonprofit organization, is seeking student interns for the 1996 summer and fall seasons. MVS is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The intern will assist in the captive maintenance of the zoo's reptile collection, collect admissions in the exhibit, give interpretive talks and interact with the public, assist with educational outreach programs, and perform other duties as assigned. In addition, the intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern will **not be involved** in the handling of any venomous reptiles. Desirable qualifications include a willingness to handle snakes and other reptiles on a daily basis, ability to communicate effectively with people, writing skills, orientation to details, and self-motivation. Students majoring in the biological or natural sciences are preferred. Former interns have arranged for academic credit with their colleges or universities. Salary and benefits include experience with the most extensive and diverse collection of snakes in the area, housing, and \$55/week in pay. Personal transportation is recommended. Starting dates are flexible, but a minimum commitment of three months covering SUMMER (June-August) or FALL (September-November) is required. To apply send a cover letter and resumé to: James R. Harrison, Executive Director, MVS Reptile Zoo, 1275 Natural Bridge Rd., Slade, KY 40376. **Deadline** for SUMMER applications is **20 March 1996**; and for FALL applications is **15 June 1996**.

BIRD CARE SPECIALIST...requires a minimum of one year paid experience. Candidate must be a team player who can work with a minimum of supervision. Duties include care and feeding of many species of birds, incubation supervision, and hand-feeding. Salary and benefits commensurate with experience. Send or fax resumé and references to: Richard L. Miller, DVM, 5700 S.W. 130th Ave., Ft. Lauderdale, FL 33330. Ph.# (305) 434-8599, FAX# (305) 434-4889.

MAMMAL KEEPER...we are seeking an energetic self-starter to work with over 50 species of mammals. Applicants must have a working knowledge of the care of exotic animals in a progressive zoo situation. Minimum qualifications: high school diploma, college preferred; two (2) years experience working with exotic animals in a zoo setting; knowledge of current zoo philosophy; willingness to accept responsibility and work with a team. Previous experience with elephants or a desire to work with elephants necessary. Salary is \$13,644.00 - \$19,136.00. Send resumé to: Steven M. Wing, Curator of Mammals, Jacksonville Zoological Gardens, 8605 Zoo Road, Jacksonville, FL 32218.

The following two (2) positions are available at Soco Gardens Zoo. Send resumé and references to: Soco Gardens Zoo, Attn: Jim Miller, Rt. 1, Box 355, Maggie Valley, NC 28751. Resumés taken until positions are filled.

ZOO KEEPERS...two immediate Full-time openings. Seeking mature, responsible keepers who would enjoy working in a small zoo setting with a small keeper staff. Requires high school diploma, paid zoo and practical exhibit construction experience. Applicants must be able to work well with the public and staff. Willing to work most weekends and holidays. Duties include but not limited to animal and reptile care, exhibit maintenance and construction, and lecturing to the public. Salary \$15,000.00 - \$17,000.00, commensurate with experience, plus health insurance.

SEASONAL KEEPER/GUIDES...May - October, six days per week. Prior paid zoo experience preferred but volunteer experience acceptable. Applicants must be neat in appearance, have audible voice, work well with co-workers and public. Duties include but not limited to giving tours to the public, all aspects of animal care. Must be willing to work with non-venomous and venomous reptiles. Salary \$190.00 per week, plus uniforms, lodging and utilities.



AAZK Membership Application check here if renewal []

Name _____

Address _____

City _____ State/Province _____ Zip _____

U.S. Members

☐

\$30.00 Professional
Full-time Keepers

☐

\$25.00 Affiliate
Other staff & volunteers

☐

\$25.00 Associate
*Those not connected with
an animal facility*

☐

\$50.00 or up - Individuals
Contributing/U.S.

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\$50.00 or up
Institutional/U.S.
*Organizations/Institutions
(requires Board approval)*

☐

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\$40.00 International
*All members outside U.S. &
Canada regardless of category*

Canadian Members

☐

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Full-time Keepers

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\$30.00 Affiliate
Other staff & volunteers

☐

\$30.00 Associate
*Those not connected with
an animal facility*

☐

\$55 or up - Individuals
Contributing/Canada

☐

\$55.00 or up
Institutional/Canada
*Organizations/Institutions
(requires Board approval)*

☐

Library Only
20.00 Library
*Available only to
established libraries*

Zoo Affiliation (if any) _____

Zoo Address _____

Title _____

Work Area _____

☐

My check is enclosed (AAZK, Inc.)

☐

Please charge my credit card

MASTERCARD _____ VISA _____ Card # _____ - _____ - _____

Name on card _____ Expiration date _____

Signature _____

Mail this application to: AAZK Administrative Offices, Topeka Zoo, 635 S. W. Gage Blvd., Topeka, KS 66606-2066. Make checks/money orders payable to AAZK, Inc. Must be in U.S. FUNDS ONLY. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

**American Association
of Zoo Keepers, Inc.
635 S.W. Gage Blvd.
Topeka, KS 66606-2066
U.S.A.**

Address Correction Requested



*"Dedicated to
Professional Animal Care"*

National Zoological Park 3/97
N.Z.P. Library
Washington, DC 20005

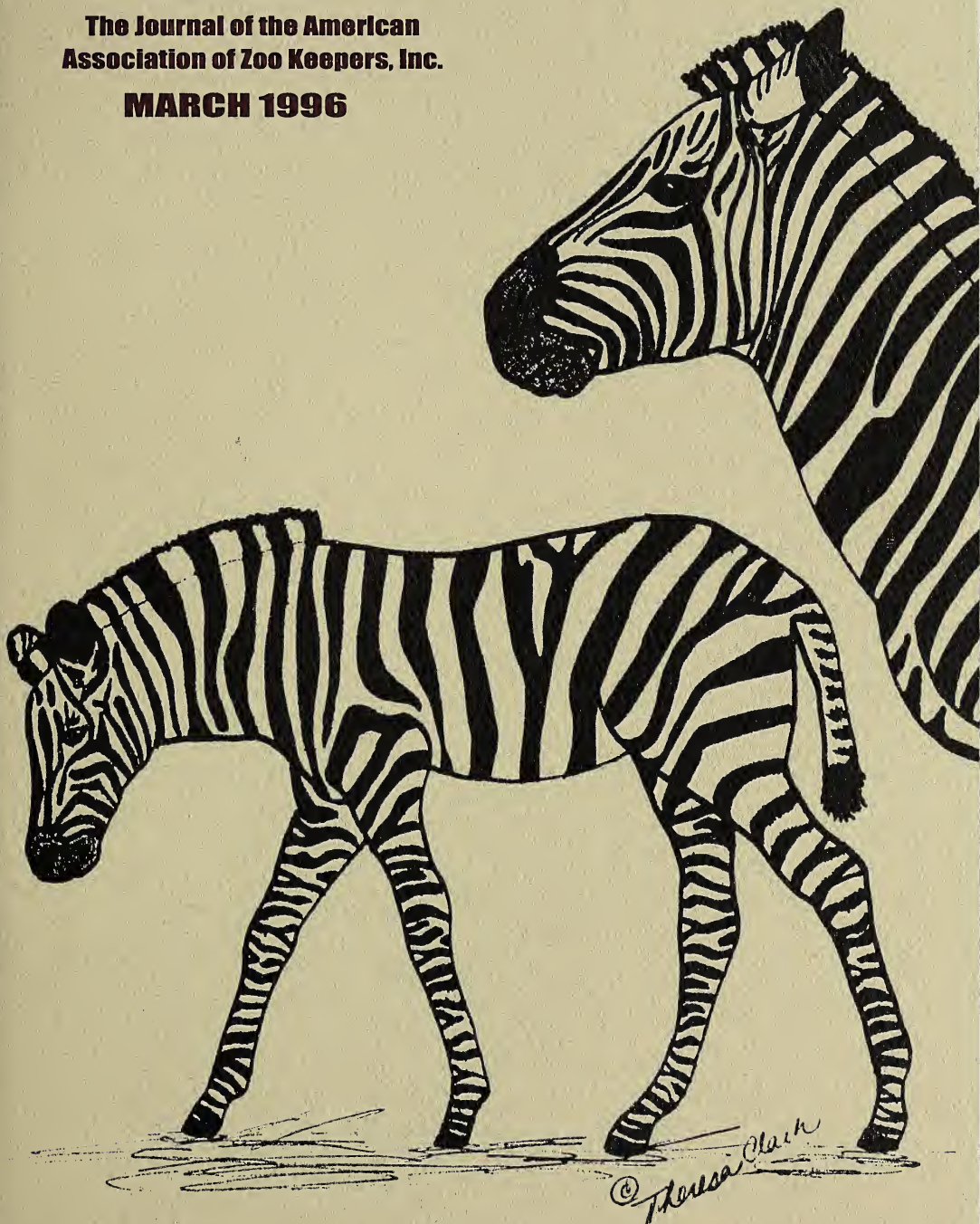
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Topeka, KS 66603

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ANIMAL KEEPERS' FORUM

The Journal of the American
Association of Zoo Keepers, Inc.

MARCH 1996



ANIMAL KEEPERS' FORUM, 635 S.W. Gage Blvd., Topeka, KS 66606-2066

Phone: 1-800-242-4519 (U.S.) 1-800-468-1966 (Canada) FAX 913-273-1980

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Diet Notebook, Mammals, Vol. II

Susan Bunn Spencer, Rockford, MI

Incubation Notebook Project

Scott Tidmus, Sedgewick County Zoo, Wichita, KS



printed on recycled paper with vegetable-based ink products

March 1996

Vol. 23, No. 3

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About the Cover.....

This month's cover art of Grant's zebra (*Equus quagga granti*) was submitted by Teresa Clark of Kansas City, MO. The zebra is found in Africa, from the Sahara to Rhodesia, and lives in family groups of up to 20. These groups coexist on the plains with other species including gnus, buffalo, gazelles and ostriches. The females bear a single foal after a gestation period of about a year. There are now three remaining species of zebra: Grevy's, Mountain, and Grant's. The Quagga, which had stripes only on the front part of its body, is extinct. Thanks, Teresa!

Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm]) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

Deadline for each regular issue is the 10th of the preceding month.

**Dedicated issues may have separate deadline dates
and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by AAZK, Inc.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

Message from the Executive Director

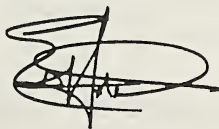
The dawn of another political season is now upon us. Primary elections and the requisite battlelines are now being drawn in the sand. If you closely examine the Presidential and Congressional records in the arena of national and international conservation over the past four years, they might be considered lukewarm at best. At worst, they are a disaster.

The Democratic government has lifted trade restrictions against various Far Eastern countries in an effort to stimulate poor economic climates. In addition to socio-economic causes, trade restrictions are thought to be an effective measure in encouraging countries to conserve and protect their own natural resources. Whether this is truly effective may never be measured because, once a country demonstrates the inclination to conserve, a restriction is lifted. Without trade restrictions, smuggling becomes ridiculously easy and immensely profitable.

The illegal trade in animal by-products grows by leaps and bounds every year. Bluntly put, Far Eastern countries will soon be responsible for the extinction of their most spectacular mega-vertebrate species. By-products really are the 1990's equivalent to gold. Asian bears are being relentlessly hunted into extinction for the want of a gallbladder, utilized in ethnic medicine. The black market price for a bear gallbladder now hovers around \$3000. Bile salts are also coveted. So much so that Asian bears are now "ranching" and catheters are surgically implanted into gallbladders to collect bile for resale. How ironic that the United States harvests thousands of black bears per year in game management programs, but the gallbladders are most likely tossed in the dirt by the hunter with the rest of the organ meat and carcass.

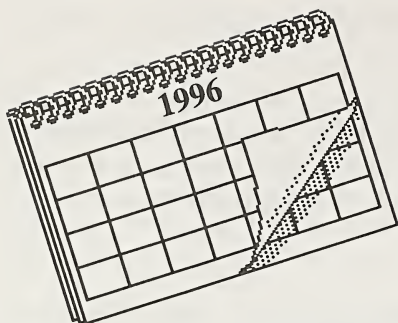
The freshly empowered Republicans continue to chip away at the integrity of the Endangered Species Act. It is now deemed politically incorrect to denounce the bill directly. Instead, our leaders seek to amend the Act with bills supporting a local political agenda. Proposed amendments to the ESA are too numerous to list in this publication, but believe me, some proposals do test the limits of political credibility.

As always, you as an individual are encouraged to vent feelings to your political leaders. It's not much, but is almost all we have.

A handwritten signature in black ink, appearing to read 'Ed Hansen', with a stylized, looping flourish at the end.

Ed Hansen, Executive Director , AAZK, Inc.

(Editor's note: The Capital Switchboard number is (202) 224-3121 (ask for your Senator or Representative's office); President Clinton's comment line is: (202) 456-1111.)



Coming Events

17th Biennial Pronghorn Antelope Workshop

June 5-7, 1996

Kings Beach, CA

Inquiries to Workshop Chairperson Laura Colton, California Department of Fish and Game, 1416 Ninth Street, Room 1280-9, Sacramento, CA 95814; Phone (916) 653-6886; Fax (916) 653-1019; and e-mail 73430.210@compuserve.com.

1996 Central Region Volunteer Conference

August 2-3, 1996

Sioux Falls, SD

The Great Plains Zoo and Delbridge Museum volunteers and staff will be hosting this conference whose theme is **Basic Issues, Saving Our Nature or B. I. S. O. N.** The round table discussion format will address such issues as the roles of volunteers, junior volunteers, outreach programs, and volunteer training/continuing education. For registration forms or more information, please contact Jackie Goosen or Vanessa Lambert at the Great Plains Zoo and Delbridge Museum, 805 S. Kiwanis, Sioux Falls, SD 57104 (605) 367-7003; Fax (605) 367-8340.

ZOOMANIA - 96

Southeast Regional Docent Conference

September 13-15, 1996

Gulf Breeze, FL

Focus of the conference will be educational programs and endangered species. Registration forms and hotel information is now available by contacting the Docent Council or Curator of Education at THE ZOO, 5701 Gulf Breeze Parkway, Gulf Breeze, FL 32561 or by calling (904) 932-2229, ext. 27.

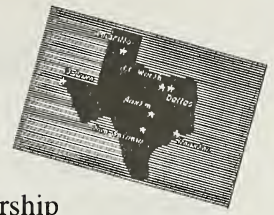
Association of Zoological Horticulture International Conference

October 4-12, 1996

Greensboro, NC

Will include a pre-conference tour to the Biltmore Estate in Asheville, a post-conference tour to the Outer banks (Manteo), topical workshops on zoo horticulture, field trips, paper sessions, traditional AZH activities and a spouses' tour. Paper abstracts due by 1 April 1996. For further information contact Corinne Benbow, North Carolina Zoological Park, 4401 Zoo Parkway, Asheboro, NC 27203.

Help Cure Those Winter Blues and Treat Yourself to a Trip to Houston!



Time is quickly winding down for this year's National Membership Campaign! Don't be left out in the cold!

We need your help to keep national membership dues from increasing in the future by recruiting new members! This is a great chance for you to win a free trip to the 1997 National AAZK Conference which will be held in sunny Houston, TX.

Remember that the top FIVE Chapters that recruit the most new members will have their recharter fees waived for 1996 and the top Chapter will be awarded their choice of a great publication as well.

This is your opportunity to help AAZK, Inc. become stronger and better. As you already now, AAZK, Inc. is an important source of information dealing with all aspects of exotic animal husbandry and is truly a unique organization with many opportunities for involvement and growth as a professional zoo keeper.

Be sure to use **ONLY** the Official AAZK Membership Drive Enrollment Form and include your name as sponsor to receive credit. Forms may be found in the January 1996 issue of *AKF* or call AO in Topeka. Please photocopy forms as needed. Also please remember the following rules:

CONTEST RULES:

1. Membership sponsor **must** be a member of AAZK, Inc. to qualify/Chapter must be in good standing with AAZK, Inc.
2. All newly solicited members **must submit** a copy of the Official Membership Drive Enrollment Form to National AAZK, Inc., and the membership sponsor's name **must** be on this form to receive credit. If a Chapter is to receive credit, it must be listed on the form.
3. The winner will be chosen by total funds raised in **new** memberships in any of the applicable categories (Professional, Affiliate or Associate memberships).
4. In the event of a tie, the individual sponsor or Chapter with the most Professional memberships will be chosen.
5. All membership enrollment forms **must** be postmarked by **1 July 1996**.

Individual Sponsor Grand Prize includes:

- Round-trip airfare to Houston, TX from anywhere in the continental United States and Canada (up to \$500)
- Hotel accommodations (4 nights and 5 days)
- 1997 National AAZK Conference registration fee.

Grand Chapter Prize: choice of AAZK Publications (DN or ZIDP) or a subscription to a magazine/journal of their choice (subject to price range set by Board of Directors).

AAZK Award Nominations Are Now Being Accepted for 1996!

The AAZK Awards Committee is accepting nominations for the **Meritorious Achievement Award (MA)** and the **Certificate of Merit for Zookeeper Education** to be presented at the 1996 AAZK Conference in Detroit, MI. The deadline for all award nominations is **1 June 1996**. Information concerning the qualifications, nomination procedure, selection procedure and an explanation of the awards may be obtained by contacting Janet McCoy, Chair, AAZK Awards Committee, Washington Park Zoo, 4001 S.W. Canyon Rd., Portland, OR 97221.

MERITORIOUS ACHIEVEMENT (MA) AWARD

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Meritorious Achievement (MA) Award presented by the AAZK Awards Committee. The purpose of the award is to recognize professional members of AAZK and AAZK Chapters, in good standing in the Association, for their extra work performed outside the keeper level of performance. This includes keeper participation in AZA Bean Award projects, dedicating time to other zoo related projects (conservation, wildlife education and individual breeding projects) and educating others in such programs as Scout Patch Programs.

The MA was established in 1982, by Mike Crocker, 1980-1985 CHAIR, as a means of recognizing work done outside of the scope of the Excellence in Zookeeping award. It is the only award presented by the Awards Committee for which you have to be a member of the Association to receive. The award is presented at the annual AAZK National Conference.

Qualifications:

1. The nominee must be a full-time keeper and professional AAZK member employed in any North American zoo, aquarium, or related facility. In the case of an AAZK Chapter, it must be 'in good standing' having an up-to-date charter with the AAZK.
2. The nominee must have been employed at least one year on a permanent basis at a zoo, aquaium or related facility. In the case of an AAZK Chapter, it must have been active for at least one year.
3. The nominee must be nominated by his/her peers or colleagues, while supporting nominations may be submitted by other zoo, aquarium or related facility personnel. The nominators need not be from the same institution.

Nomination Procedure:

1. List name, position, institution's name, address, phone and Director, years of service in the field and the recommendation of a peer or colleague.

2. List and **document** the outstanding achievements: AZA Bean Award project participation, exhibits, breeding, conservation, etc.

3. The deadline for nominations is JUNE 1st of each year.

Selection Procedure: The Awards Committee, consisting of five keepers, will independently review each nominee.

CERTIFICATE OF MERIT FOR ZOOKEEPER EDUCATION (CMZE) AWARD

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Certificate of Merit for Zookeeper Education (CMZE) presented by the AAZK Awards Committee. The purpose of the award is to recognize individuals, institutions and organizations in the zoological community most actively promoting educational programs for zookeepers. Examples of such support are: reimbursements for formal education, keeper training courses and staff seminars.

The CMZE was founded by Jeff Roberts, 1976-1978 CHAIR, in 1978, to compliment the work of the AAZK Education Committee that had been formed at that time. The award is presented at the annual AAZK National Conference.

Qualifications:

1. Any staff individual, institution or organization from a North American zoo, aquarium or related facility is eligible.
2. The keeper training program must have been in existence for at least one year.

Nomination Procedure:

1. If you feel that your institution, organization or a staff individual merits such an award, please submit a letter of nomination which mentions specifically the educational programs that are offered.
2. Claims made should be backed up with documentation for the committee to review.
3. List the institution or organization's name, address, phone and Director.
4. The deadline for nominations is JUNE 1st of each year.

Selection Procedure: The Awards Committee, consisting of five keepers, will independently review each nominee.

Births & Hatchings



The Commonwealth Zoological Corporation (Franklin Park & W. D. Stone Memorial Zoos)...report the following significant hatchings for July 1995 through January 1996:

Birds - 0.0.1 Chilean flamingo (*Phoenicopterus chilensis*) [1st hatch for institution]; 0.0.1 greater flamingo (*Phoenicopterus ruber*) [1st hatch for institution]; 0.0.1 sun bittern (*Eurypyga helias*) [U].

Reptiles - 0.0.2 African spurred tortoise (*Geochelonyx sulcata*) [1st hatch for institution]; 0.0.37 panther chameleons (*Chamaeleo pardalis*) [1st hatch for institution/ 0.0.1 DNS]. *submitted by Tom Aversa, Senior Zookeeper, Franklin Park Zoo, Boston, MA.*

The North Carolina Zoological Park (Asheboro, NC)...is proud to announce the hatching of a thick-billed murre (*Uria lomvia*). It is believed that this is the first zoo hatching of this species in the United States. The chick hatched on 12 August 1995 after 32 days of incubation. Parent-reared, the chick fledged after 23 days on 4 September 1995. The chick is adjusting well to the colony which also contains horned puffins (*Fratercula corniculata*) and parakeet auklets (*Cyclorhynchus psittacula*). This hatching was the first for the Rocky Coast Alcids Exhibit which opened on 20 April 1995. The keepers were able to closely monitor and help feed the chick without disturbing the natural nesting behavior of these birds. *submitted by Victoria G. Roose, Alcids Keeper II, Rocky Coast, North Carolina Zoological Park.*



Photo shows Thick-billed Murre chick at NCZP.

(Photo by Vicki Roose)



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AKF Survey Results.....Part 1

Following are the statistical results of the AKF survey taken in October/November of last year. There were 176 surveys turned in for tabulation. In reading these results keep in mind that all respondents did not answer all questions. The first figure given is the number of respondents replying in a particular category; the second figure is the percentage of the total response for a particular question. The comment portion of the survey is being analyzed and compiled and will be published in an upcoming issue of AKF. We would like to thank those members who took the time to respond to this survey.

1. How long have you been a keeper? (Total 158)

- a. 1-5 yrs. (63/ 40%) b. 6-10 yrs. (62/ 39%)
c. 11-15 yrs. (19/ 12%) d. 16-20 yrs. (10/ 6%) e. over 20 yrs. (4/ 3%)

2. How long have you been reading AKF?(Total 176)

- a. less than a year (12/ 7%) b. 1-5 yrs. (66/ 38%) c. 6-10 yrs. (63/ 36%)
d. 11-15 yrs. (18/ 10%) e. over 20 yrs. (16/ 9%)

3. Asked for State or Province of respondent - results not shown here

4. Do you read your monthly AKF? (Total 176)

- a. always (160/ 91%) b. sometimes (16/ 9%) c. rarely (0)

5. Which of the regular and semi-regular sections of AKF are the most liked?

	ALWAYS	SOMETIME	RARELY
(176) Scoops & Scuttlebutt	80 (45%)	54 (31%)	42 (24%)
(172) Births & Hatchings	78 (45%)	66 (40%)	26 (15%)
(176) Coming Events	133 (76%)	41 (23%)	1 (1%)
(176) Chapter News	60 (34%)	88 (50%)	28 (16%)
(176) Book Reviews	50 (28%)	91 (52%)	35 (20%)
(176) Legislative Update	69 (39%)	75 (43%)	31 (18%)
(176) Information Requests	148 (84%)	24 (14%)	4 (2%)
(176) Opportunity Knocks	150 (85%)	19 (11%)	7 (4%)
(176) Viewpoint	68 (38%)	84 (47%)	25 (14%)
(176) From the President	62 (38%)	83 (47%)	29 (16%)
(175) Down Under	58 (36%)	80 (46%)	37 (21%)

	ALWAYS	SOMETIME	RARELY
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(175)	Enrichment Options	146 (84%)	24 (14%)	4 (2%)
(176)	Husbandry Articles	120 (68%)	55 (31%)	1 (1%)
(176)	Research Articles	101 (57%)	68 (39%)	7 (4%)
(176)	Narrative Articles	84 (48%)	81 (46%)	11 (6%)

6. Do you feel there is enough information in AKF about what is happening in AAZK to keep you informed about your Association? (Total 173)

Yes- 140/ 81%	No- 18/ 10%	No Opinion- 15/ 9%
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8. Are you still finding the Enrichment Options column helpful? (Total 176)

Yes- 166/ 94%	No- 4/ 2%	No Opinion- 6/ 3%
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9. Do you find the Births and Hatchings column useful? (Total 176)

Yes- 123/ 70%	No- 42/ 24%	No Opinion- 11/ 6%
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10. Do you find the Legislative Update column informative and helpful in keeping you aware?(176)

Yes- 152/ 86%	No- 16/ 9%	No Opinion- 8/ 5%
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11. Over the past three years, what is your rating of the quality of cover art? (Total 176)

Excellent- 139/ 79%	Fair- 36/ 20%	Poor- 1/ 1%
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12. Do you find the Table of Contents helpful? (Total 176)

Yes- 105/ 60%	No- 27/ 15%	No Opinion- 44/ 25%
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13. Regarding the recent format changes in the AKF, how do you view these changes? (Total 176)

Postive- 155/ 90%	Negative- 1/ 1%	No Opinion- 17/ 9%
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14. How would your rate the job being done by the editors in putting together the AKF and in covering topics of interest to the membership?

(176)	Formatting of AKF	Excellent- 107/ 61%	Good- 64/ 36%
		Fair- 5/ 3%	Poor- 0
(176)	Contents of AKF	Excellent- 107/ 61%	Good- 60/ 3%
		Fair-6/ 3%	Poor- 1/ 1%
(176)	Grammer/Spelling	Excellent- 101/ 57%	Good- 68/ 39%
		Fair- 5/ 3%	Poor- 2/ 1%

Information Please

We are looking for the names of any North American facilities that house nocturnal animals. We are trying to put together a handbook for nocturnal collections. If anyone knows of a zoo or research facility that has nocturnal animals, please fax the names, addresses, phone and fax numbers to us.

We are also looking for suggestions on substrates to be used for indoor exhibits. In the past we have used sand, corn cob, wood shavings, clay litter, and yesterday's news cat litter. Each of these has its own unique problems. If anyone has found a substrate that is natural looking, non-toxic and possibly cost effective (we have some large spaces to cover) please send suggestions to: Stephanie Richardson/Matt Thompson c/o Memphis Zoo-Nocturnal Building, 2000 Galloway, Memphis, TN 38112. (901) 726-4787 ext. 3117. FAX (901) 725-9305.

We will be constructing a new river otter (*Lontra canadensis lataxina*) habitat, and would like any information regarding 1) holding space for quarantine and/or separating animals; 2) otter access to dens/holding areas from exhibit (i.e. how many entrances, underwater vs. land, etc.); 3) maximum number of animals kept together; 4) keeper considerations (cleaning exhibit and holding areas, separating animals, etc.). Please contact: Michele Setter, Texas State Aquarium, P.O. Box 331307, Corpus Cristi, TX 78463; phone (512) 881-1216; fax (512) 881-1257.



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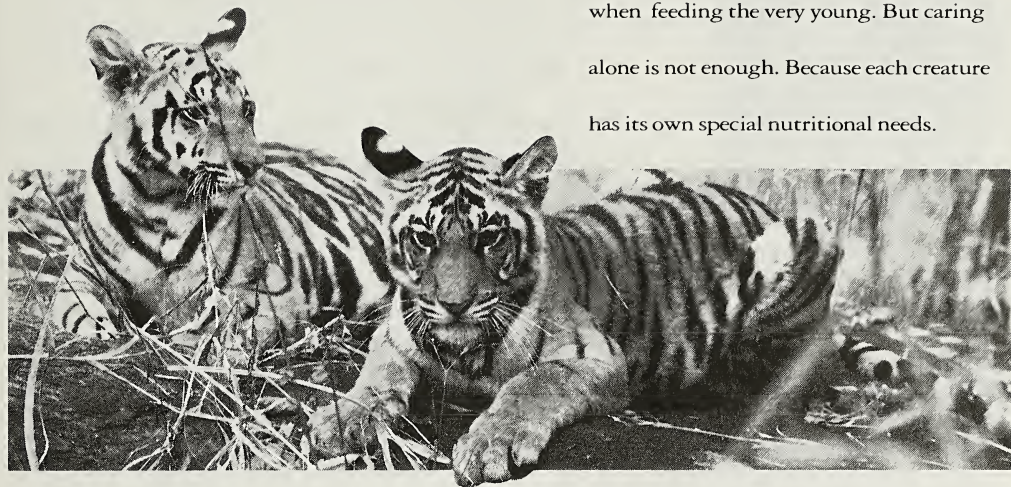
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Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero
Independent Behavior Consultant
Ark Animals of California, San Diego, CA

(About the Author: Since 1978 Diana has been active both in the U.S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training.)

As we evolve in our profession as animal keepers there are more and more demands made upon our daily regimen. Time is of the essence in our work and as the roles we fill expand it is to our benefit to utilize any labor or timesaving strategies which will enable us to get everything done in a regular day's regime. One of those tools is the use of behavior strategies and techniques.

Many keepers will groan when they hear talk of behavioral conditioning, training, or related topics since their experiences have been with labor intense programming and technical jargon. There is a better more effective way to utilize those techniques and understand the jargon in day-to-day terminology, unless of course you seek to impress someone. Most just want something to work, then help on getting to the next step or through a temporary hurdle. That is the goal of ABC'S.

This column will serve as a forum for questions and answers regarding day to day strategies like the gibbon that refuses to come off exhibit when you are fighting going into overtime; or the animal that decides to keep the rest of the group in during the morning release, or out at evening lockup.

The goal is to help develop strategies to address those types of scenarios successfully using "cracks of time" instead of painstaking hours or methodical training sessions, and to take advantage of "windows of opportunity" to teach the animals the desired behaviors.

To participate you can send in your question, background on the routine and animal(s), or call it in. We will gather information and present an overview of possible causes and solutions. Each case will be handled confidentially with facility, names, and identifying details omitted unless directed otherwise.

In the coming months we will be covering such topics as the special language of behavior training and scenarios dealing with chimpanzees, tigers, elephants, sea lions and rhinos.

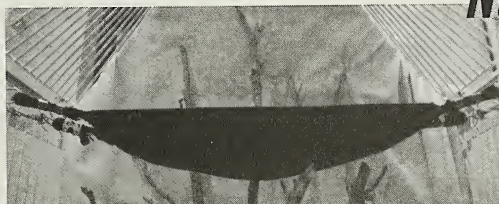
Send questions into ABC'S c/o *Animal Keepers' Forum* in Topeka or call (800) 818-7387 and leave your name, area code, daytime (with extension) and evening phone numbers. Look forward to your questions! *Next mont: Lingo Limbo.*

1996 AZA™ REGIONAL CONFERENCES

Eastern Regional - April 10-13, 1996 - to be held in Greenville, SC. For further information contact Bob Wilson, Greenville Zoo, 150 Cleveland Park Dr., Greenville, SC 29601 (803) 467-4300.

Western Regional - May 15-18, 1996 - to be held in Denver, CO. For further information contact Angela Baier, Denver Zoo, 2300 Steele St., Denver, CO 80205 (303) 331-5805.

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Chapter News Notes



Kansas City AAZK Chapter

The Kansas City Chapter of AAZK held their election of officers for 1996. The results are:

President.....Jacque Blessington
Vice President.....Beth Moore
Secretary.....Jennifer Shillcox
Treasurer.....Wendy Schaffstall

Penny L. Cram was appointed to serve as Chapter Liaison.

—*Penny L. Cram, Chapter Liaison*

South Florida Chapter AAZK

Officers for 1996 are:

President.....Michael Hernandez
Vice President.....Kathy Hitchcock
Secretary.....Pam Monseur
Treasurer.....Susan Kong

We started the year with a magician entertaining us at our first meeting. It was a fun way of starting a year full of plans for fundraisers. Bowling for Rhinos, a Behind-the-Scenes Tour Raffle, a Garage Sale, Breakfast with the Keepers, and our end of the year Banquet are some of the things on our agenda.

We are also sending our Keeper of the Year, Rebecah Mulder, to the National AAZK Conference in Detroit and giving some financial assistance to Katrina Osburn, one of our keepers who won the 1995 Bowling for Rhinos trip to Africa. Congratulations to both!

—*Michael Hernandez, President*

Philadelphia Chapter AAZK

In December, the following officers were elected for 1996:

President.....Teri Maas-Anger
Vice President.....Ken Pelletier
Secretary.....Sandy Skeba
Treasurer.....Maggie Liqouri
Chapter Liaison.....Robin Sweet

The Philadelphia Chapter's Conservation funding for 1995 was dispersed to the following organizations: Hornocker Wildlife Research Institute - Siberian Tiger project: \$250; Hawk Mountain Sanctuary: \$200; Marine Mammal Stranding Center: \$200; National Resource Defense Council: \$100; ASZK (Australasian Society of Zoo Keepers) *Thylacinus* subscription: \$70; Galapagos Islands/Darwin Research Station: \$50; The Nature Conservancy: \$35; Schuylkill Environmental Education Center: \$30; Bat Conservation International: \$30; Cape May Bird Observatory: \$30; Pennypack Park: \$25; World Wildlife Fund: \$15; *Shape of Enrichment* (newsletter) \$12.00. \$500.00 has also been contributed to Zoo Peru, Inc.

San Diego Chapter AAZK

First off we'd like to thank the Denver AAZK Chapter for a great conference! We know how much work it takes to produce a conference and you are all

to be commended. We sent five members this year and everyone really enjoyed visiting with and learning from many new and old friends.

Our Chapter has been quite busy these past months. We recently accepted the resignations of two of our board members and thus decided to downsize our board from nine to seven members. Our latest issue of the *Keeper* was finally printed and mailed after countless publishing and printing problems. We apologize for the delay and remind you to be sure and look for the enclosed flyer on how to receive a free copy of our 1996 Animal Buns calendar inside your *Keeper*. We are proud to announce that our 1996 Animal Buns calendar is out and about in gift shops and several Chapters. Look for ordering information in the *Keeper*, in the December 1995 issue of *AKF*, and on the Internet (<http://cyberpalace.connectnet.com>).

In September we held our annual summer safari photo caravan at the Wild Animal Park. We took a four-hour tour through all of our field exhibits. Aside from hand-feeding giraffe, rhinos, and wisent, we were treated to close-up views of a two-month old Indian rhino and a three-week-old Baringo giraffe. A pair of white-lipped deer and the baby giraffe were also generous enough to let us practice taking potential "Buns" pictures. Everyone had a great time.

We had a creepy crawly discussion with David Faulkner about his work in Forensic Entomology at the end of October. It was a perfect Halloween-time topic, but was not for the squeamish. Though a bit graphic, David's work is very fascinating and everyone really learned a lot. In fact,

several keepers who could not attend the talk have requested a lunchtime discussion at work (actually bringing your lunch though is not advised).

JoAnn Simpson, an Animal Trainer at the San Diego Zoo, was greeted by a great turnout when she spoke at our November meeting on the use of operant conditioning to manage drill baboons. JoAnn has been one of the trainers involved in the breeding program with an off-exhibit group of drills up at our CRES facility. Despite a few setbacks and disappointments, the conditioning has been an overall success.

Our Christmas party was a huge success! We thanked our membership for their support and patience in the past year by hosting a catered party at Tree Tops at the San Diego Zoo. The party would not have been as grand if the San Diego Zoo had not made such a generous donation. Our thanks! Photographer Ron Garrison thoroughly entertained us with slides and stories of "dream walking in Africa". A great time was had by all!

—JoAnn Haddad, Chapter Liaison

San Antonio Chapter AAZK

The members of the San Antonio AAZK Chapter in December voted to sponsor an AAZK International Membership for the Simon Bolivar Zoo in San Juan, Puerto Rico. The Simon Bolivar Zoo is a sister zoo of the San Antonio Zoo. Through the efforts of Robert Evans, San Antonio's Curator of Mammals, and Yolanda Matamoros, Director of the Simon Bolivar Zoo, this sister zoo relationship was established. As a way

to exchange information between the two staffs, a keeper exchange program was developed and is intended to last for several years.

In November, San Antonio Keepers Luis Castro and Gilbert Gomez went to the Simon Bolivar Zoo for two weeks. An employee from that zoo will also be doing an exchange visit in San Antonio. The exchanges will be repeated as long as there is a benefit to both institutions. Housing and transportation are provided and the employees' salaries and benefits continue as usual during the exchange.

In addition to sponsoring the AAZK membership for the Simon Bolivar Zoo, the San Antonio chapter also sent the past year's issue of *Animal Keepers' Forum* to the staff in Costa Rica.

—Jeff Perry, President

Honolulu Chapter AAZK

Hauoli Makahiki from Hawaii (Happy New Year)!

Despite our relatively inactive status for most of 1995, we did finish off the year with a bang! For the first time, the Honolulu Zoo held a holiday 'Wild Lights' event complete with lion, toucan, crocodile, peacock, giraffe, elephant and flamingo-shaped lighted animals throughout the zoo grounds. During the light and local music festivities, Chapter members sold Haagen-daaz™ ice cream and Wild Lite™ and AAZK merchandise and raised over \$450.00 in a mere six days!

Our 1995 President, Michael Seeley, unfortunately had to resign from his position mid-year and leave the zoo to move to New Jersey with his family.

Up until that time, Michael organized frequent training lectures given by fellow keepers from a variety of different departments. We all wish him the best of luck and hope he's keeping warm!

January marked the election of our new and returning Chapter Officers for 1996. They are:

President.....LeeAnn Anderson
Vice President.....Jennifer Lanier
Secretary.....Shane Siers
Treasurer.....Linda Meier

Much of our focus this past year was in animal enrichment. Shane Siers headed this committee and has kept our zoo informed of new and interesting tidbits of enrichment through his newsletter the Enrichment Enquirer. This year will continue to stress the importance of enrichment of captive exotic animals.

In September the 1996 AZA National Conference will be hosted by the Honolulu Zoo, Waikiki Aquarium and Sea Life Park. The AAZK Honolulu Chapter will play an integral part in making visiting participants feel welcome to our sunny isle in every way possible!

We look forward to seeing many of you in September!

--LeeAnn Anderson, President



AMERICAN ASSOCIATION OF ZOO KEEPERS



"WE HAVE THE TOOLS TO CHANGE OUR ENVIRONMENT"

1996 NATIONAL CONFERENCE
DETROIT, MICHIGAN

"WE HAVE THE TOOLS TO CHANGE OUR ENVIRONMENT"

**1996 NATIONAL CONFERENCE
DETROIT, MICHIGAN**

OCTOBER 6-10, 1996

The Detroit Chapter of AAZK and the Detroit Zoological Institute would like you to join us for the 23rd National AAZK Conference.

Expect a lot! We have a lot to share with you.

SATURDAY, OCTOBER 5:

Pre-Conference Trip - A Michigan Loop to Binder Park Zoo and John Ball Park Zoo. Experience their exciting, brand new exhibits.

SUNDAY, OCTOBER 6:

Committee Meetings and Icebreaker. Boogie down with your fellow Keepers. It's the best time to Grapevine (and other fancy dances).

MONDAY, OCTOBER 7:

Paper Sessions and Workshops. We encourage Paper submissions from Keepers and Aquarist of all Species. We are planning to hold concurrent sessions.

TUESDAY, OCTOBER 8:

Workshops. Lunch at the Belle Isle Zoo and Belle Isle Aquarium. The Belle Isle Zoo is 13 acres of mainly Boardwalk exhibits, featuring Spectacled Bears, Maned Wolves and Sumatran Tigers. One of the Oldest Freshwater Aquariums, the Belle Isle Aquarium was established in 1904. Have a ball in the **1996 Zoolympics.** Come aboard the **Diamond Belle Riverboat** where we'll view the Detroit and Canadian Riverfront as we cruise the Detroit River. Take home a treasure from the **Silent Auction.**

WEDNESDAY, OCTOBER 9:

Detroit Zoo - Zoo Day. Join us for a full day of Behind-the-scenes tours. The Detroit Zoo is 125 acres of spacious exhibits, featuring a Penguinarium, an

extensive Reptile and Amphibian collection, a newly opened Wildlife Interpretive Gallery, a 4acre Chimpanzee and Gorilla Complex plus much more. **Zoo Workshops** will include: Giraffe Squeeze Hooftrim, Elephant Footcare Nail Patch, Penguin Husbandry and Butterfly/Hummingbird Husbandry. Even more **Workshops** in the evening.

An **AAZK INC. HOSTED WORKSHOP** will be featured during the conference. This workshop will emphasis various professional aspects of our careers.

THURSDAY, OCTOBER 10:

Paper Sessions, Annual Business Meeting, Live Auction and Final Banquet. Dinner and Dancing with your new found friends and associates.

FRIDAY-SUNDAY, OCTOBER 11-13:

Post-Conference Trip - An Ohio Loop to the **Sea World of Ohio**. The season may be over but the action isn't over. What goes on when the crowds go away? We'll spend a day at the **Cleveland Metropark Zoo**. A special attraction is their new RAINFOREST EXHIBIT. Last, we will tour **The Wilds**. The Wilds is over 9000acre of land used for animal conservation management, research and education.

OTHER THINGS TO SEE AND DO AROUND DETROIT:

Henry Ford Museum and Greenfield Village

Detroit Science Center

Detroit Institute Of Arts

Hitsville U.S.A.

Cranbrook Institute of Science

Windson Casino and Riverboat Casino - (must have a birth certificate and/or passport to go through Customs)

Toledo Zoo - only one hour away.

Potter Park Zoo - one and a half hours away



Book Review

Mitsuaki Iwago's Kangaroos

By Mitsuaki Iwago - 1992
Chronicle Books
275 Fifth Street,
San Francisco, CA 94103
218 pgs. Paperback \$19.95

*Review by Rebecca Smithson
Keeper, Australian Pavilion
National Zoological Park
Washington, DC*

Mitsuaki Iwago is a wildlife and nature photographer and author whose work has appeared in *National Geographic* and *Life* magazines. He has taken award-winning photographs of wildlife in more than 70 countries. In this book, Iwago turns his camera on the Australian outback where he captures the essence of red kangaroos in their daily lives. The photographs reflect a range of behaviors from their struggle for survival in a harsh desert environment to the whimsical antics of a gangly young joey. There are many heartwarming and humorous pictures of mother-joey relationships and of kangaroos just trying to scratch those hard-to-reach places. Along with his portraits of kangaroos mating and raising their young, Iwago presents some remarkable close-ups of joeys in the pouch at various stages of development.

The easy-to-read book is about 90% photographs and 10% text and may be enjoyed by anyone with an interest in macropods, the Australian outback or nature photography. The text consists of basic yet interesting facts about kangaroo behavior and adaptation, as well as some information on Australia's terrain, climate and a few of its National Parks.

Mitsuaki Iwago's Kangaroos, with its superb shots of males boxing and mobs grazing peacefully under a magnificent Australian sunrise, is truly a stunning collection of photographs of red kangaroos up close and personal.

"The Secret World of Animals - Below and Above the Ground"

Produced by David Tarnow

Canadian Museum of Nature, 1991, Distributed by UBSS University
Book Sales and Services, Inc., 4823 Sherbooke Street West, Room 110
Westmount, Quebec, Canada H3Z 1G7
Audiocassette 61:22

*Review by Melba Brown
Zoo Keeper, Central Mammals
National Zoological Park
Washington, DC*

"The Secret World of Animals-Below and Above the Ground" is a lively audiocassette featuring the words of leading scientists on the nature of 'the

little things that run the earth', as stated by Dr. E. O. Wilson of Harvard. These little things are ants, crickets, cockroaches, spiders and bumblebees. Just how interesting can a tape be on such a subject? Very interesting and enlightening! Throughout each exploration, the listener realizes just how prominent and vital these animals are in our ecosystem.

Five experts take their turn bringing out intriguing facts on their respective subjects. Dr. Franz Huber, Director of Neuroethology at the Max Planck Institute for Behavioral Physiology, discusses cricket sounds. Differences can be detected when listened to at half speeds. These differences can actually be heard on the tape. It has been determined that specific sounds are produced for calling, courtship and threats.

Dr. Jean Fraser, a biologist from Boston University, focuses on the cockroach, something most people find rather unappealing. Hissing cockroaches, however, from Madagascar are unique insects. Imagine a roach that is two inches long and weighs up to 25 grams. Dr. Fraser offers possible reasons why these roaches hiss. They include hissing when disturbed, courting (soft hisses) and fighting. Territorial behavior, sound production and antennae movements are also discussed.

Many of us have probably encountered spiders and have taken a few moments to marvel at their seemingly crocheted webs. Dr. Michael Robinson, Director of the National Zoo, has spent much time studying web-building spiders. In his discussion of these arachnids, he reveals their predatory nature and the fact that some species have evolved into social web builders. Dr. Robinson has seen webs the size of a small room. For instance, in Papua, New Guinea, a web was constructed that measured 30 feet across! Also, the listener discovers that some spiders have created ingenious ways to snare elusive moths. These are some of the many fascinating facts told about spiders.

Dr. Richard Fisher, professor of biology, Arcadia University, talks about bumblebees. A queen usually selects a location to start a nest. (One of the more unusual places noted by Dr. Fisher was old car upholstery.) Once an appropriate site is found, the queen lays eggs. The eggs develop into workers and later, she may raise other queens and males. It was interesting to learn that some queens may try to take over an already established nest instead of starting one of their own. Dr. Fisher concludes his section with a discussion of communication via pheromones.

Dr. E. O. Wilson's work with ants reveals that they have poor vision and hearing; and, a high sensitivity to humidity and air currents. One of the more interesting tidbits about ants is that in some species, the ultimate act of altruism involves blowing themselves up to release a toxin, found in a gland, to ward off enemies.

This highly informative tape concludes with a plea to save the world's ecosystems. Overall, I enjoyed listening to the scientists unearth the secret nature of these creatures. I am sure anyone who listens to this tape will gain a greater respect for these all-too-often dismissed animals. More significantly, one will realize that their diminutive sizes do not diminish their essential existence.

AAZK Announces New Professional & Contributing Members

Katherine E. Eldridge **Furry Friends Zoo (NH)**; Tanya Valle, **Queens Wildlife Center (NY)**; Francis Verna, **Prospect Park Wildlife Center (NY)**; Susan Sabik, **Thompson Park (NY)**; Megan Hart Dudek, **Baltimore Zoo (MD)**; Kristi Simpson, **Raleigh, NC**; Lawrence M. Elliott and Kenneth Robinson, **Brookgreen Gardens (SC)**; Michele L. Gordon, **The Zoo (FL)**; Sabrina Murray, **Central Florida Zoological Park (FL)**; Rebeccah Mulder and Luis Michael Hernandez, **Miami Metrozoo (FL)**; Laura Martuscelli, **Tequesta, FL**; David R. Seger, **Busch Gardens (FL)** Loribeth Dixon Hamlett, **Nashville Zo (TN)**; David P. Winkler, **Cleveland Metroparks Zoo (OH)**; Paul Cross, **Me's Zoo, Inc. (IN)**; Fred Swengel, **Minnesota Zoo (MN)**; Connie R. Caekaert, **Zoo Montana (MT)**; Brad Green and Tina M. Owens, **Kansas City Zoo (MO)**; Andrea C. Lane, **Dickerson Park Zoo (MO)**; Gary L. Stoops, Jr., **Henry Doorly Zoo (NE)**; Mark A. Hood, **Riverside Zoo (NE)**; Heather M. Parker, **Audubon Zoo (LA)**; Nicola Appleton, **Greater Baton Rouge Zoo (LA)**; Dino Ferri, **Ellen Trout Zoo (TX)**; Dudely McCalla and Lisa Rogers, **Houston Zoo (TX)**; Elizabeth Boomer, **Hogle Zoo (UT)**; Zoltan Tresz, **Tempe, AZ**; Susie Kasielke, **Los Angeles Zoo (CA)**; Nancy J. Dorger, **Oakland Zoo (CA)**; and Kathy Sdao, **Pt. Defiance Zoo (WA)**.

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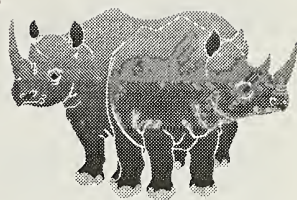
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Bowling for Rhinos Update

*from Patty Pearthree, BFR Coordinator
Indianapolis, IN*



In 1995, BFR raised over \$120,000 for Lewa Wildlife Conservancy -LWC (formerly called Ngare Seroi rhino sanctuary) in Kenya and for Ujung Kulon National Park in Java, Indonesia. The first \$100,000 each year will continue to support LWC with the remainder going to Ujung Kulon.

Katrina Osborne from Miami Metro Zoo and Ken Smith from Jacksonville, FL along with their guests will soon be taking their prize-winning, two-week trip to Lewa for raising the most funds in 1995.



In order to be eligible to win the 1996 trip, all monies must be received by me no later than 1 September 1996 and you must be a National AAZK member!

Make checks payable to AAZK, Inc. and please write "FOR DEPOSIT ONLY" on the back before mailing. This will keep them from being cashed by anyone else. Send to: Patty Pearthree c/o

Bowling for Rhinos, P. O. Box 199026, Indianapolis, IN 46219-9026.

We are delighted to announce that we have a new prize for the individual who raises the third highest amount of money in BFR '96 (after the two trip winners). It is a handmade ceramic rhino statue that measures about 2' x 1' (see photo inset) and was kindly donated by Toni Nichols from California. Thanks, Toni!

I have received many inquiries from individuals who would like to join the nearest Bowl-A-Thon. In order to help them, I need to have the postcards I sent to each Chapter returned to me as soon as possible to have current information to give these individuals. I also have BFR posters for anyone holding an event.

Bowling for Rhinos is not limited to just bowling. Some other BFR funds are raised through "Rock n' for Rhinos", "Rummage for Rhinos", "Run for Rhinos", "Recycle for Rhinos" or outright donations. If you have questions, please call me at (317) 322-8723.

Tree Kangaroo SSP Avian TB Research Fund Update

By Judie Steenberg, Woodland Park Zoo, Seattle, WA

Beginning in January 1995, the Tree Kangaroo Species Survival Plan© (TK-SSP) embarked on a campaign to raise \$38,000 to fund research for the development of diagnostic tests and a vaccine to protect tree kangaroos from *Mycobacterium avium*, commonly known as Avian TB. The results of this research will also benefit other marsupial species, especially small macropods.

As 1995 came to a close, all but \$863.88 of the \$38,000.00 had been pledged with 99% of those funds already received. TK-SSP Institutions contributed funds amounting to \$18,514.62. Thirteen AAZK Chapters contributed a total of \$5,601.50. Chapters contributing were: Puget Sound (Seattle, WA), Platte River (Lincoln, NE), Jacksonville (FL), Columbus (OH), Cleveland (OH), Memphis (TN), Roger Williams Park Zoo (Providence, RI), Mt. Tahoma (Point Defiance Zoo, Tacoma, WA), Bronx (NY), Caldwell (TX), San Diego (CA), Kansas City (MO), and the Chinook Chapter of the Calgary Zoo. Individuals contributed a total of \$1,470.00 to the fund (not previously mentioned were Roberta Rae, Elaine Kirchner and Robert Bagely). Another significant donation was the \$10,000.00 received through the AZA from the Disney Foundation. Together, we made it happen.

All donations are sincerely appreciated and allow the TK-SSP to address the **Number 1 Priority** in the Five-Year Action Plan...solving the problem of Avian TB in captive populations of tree kangaroos. The future of tree kangaroos in captivity and the TK-SSP depends a great deal on this vital research.

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Herd Interactions Of Chacoan Peccaries (Catagonus wagneri) Costs and Benefits

By Daniel M. Brooks

Houston Zoological Gardens, Houston TX

and

University of Houston, Department of Natural Sciences

Introduction

Description and analysis of integrated life history traits are important in determining the long-term allocation of energy to somatic and reproductive functions (Strauss, 1990). To obtain a more integral understanding of evolutionary stable strategies, behavioral ecologists have analyzed the relationship between social structure and its economic benefits and costs within different species of social animals. In mammals, such studies have focused primarily upon primates (e.g. Chepko-Sade et al. 1989) and mega-ungulates (e.g. Carranza, 1988). The main objective of this paper is to consider benefits and costs of social behavior in the Chacoan peccary (*Catagonus wagneri*), a medium-sized forest ungulate with a mean weight of 35 kg. (77 lbs) (S. Kingswood, unpubl. data) which was discovered two decades ago, and is endemic to South America's Chaco (Wetzel et al. 1975).

Previous behavioral studies of *Catagonus* concentrated on movements, scent-marking, vocalizations, aggression, behavioral development, and specific behavior repertoires (Sowls, 1981, 1984; Mayer & Brandt, 1982; Brooks, 1992). Taber et al. investigated ranging behavior (1993) and activity patterns (1994), while Haden & Benirschke (1991) examined feeding associations within a herd.

While studying *Catagonus* over the course of a year, several aggressive interactions were observed in what was thought to be an otherwise peaceful species. Observation of these interactions prompted analysis of social herd interactions from a benefit/cost perspective, which has not been investigated in this species. Specific questions to be addressed herein are: 1) Is dominance linear among males, females, or both sexes combined? 2) Are contact interactions initiated equitably by various age-sex class members? 3) What are the benefits and costs associated with behavioral patterns? Such results will hopefully further elucidate upon previous findings (Brooks, 1992), such as why *Catagonus* exhibits a polygynandrous mating strategy, as well as mechanisms of group cohesion.

Methods

A herd of animals was studied at Proyecto Tagua (the Tagua Project, Tagua being the indigenous name for Chacoan peccary) for one year, from September 1989 to August 1990. Located virtually in the center of the Paraguayan Chaco, the study site was described in detail elsewhere (e.g., Haden & Benirschke, 1991) as have data collection methods (Brooks, 1992). A brief summary of the study site and data collection methods follows.

The study herd was comprised of four wild-caught adult males, three wild-caught adult females, one captive-born adult female, and three captive-born juveniles (status as of

August 9, 1990). The herd was studied under semi-natural conditions, in a large 5 ha. (12.4 acres) enclosure containing native vegetation and three ponds. The animals were observed at a baited feeding site from an elevated blind. This was complemented with periodic observations from a higher blind overlooking the main pond, as well as observations on foot. Study times ranged from 0530- 2000 hrs., though most of the study durations were from 1400- 1800 hrs. Age-sex classes were categorized as follows: adult male, adult female, sub-adult (fully weaned but not full grown), sub-juvenile (semi-weaned), and infant (fully dependent upon association with older animal). Adults were ear-tagged, and younger individuals were recognizable by differences in size and coat condition. All occurrence sampling data (Altmann, 1973) were collected for all visible interactions, because individuals drifted in and out of view (Byers, 1983).

Application and definition of dominance has caused confusion over the years (Barrette & Vandal, 1986). Rowell's (1974) definition of dominance was followed, where one individual in an asymmetrical (i.e., dominant and subordinate) relationship loses a fight in response to the other individual's aggressive actions, however relaxed and peaceful the retreat might appear. Each such encounter was counted as a dominance interaction sample. Due to small sample sizes, simple matrix tables were used to determine whether a linear hierarchy occurred among males and among females. The general test for the significance of linearity in hierarchies (Appleby, 1983) was used to determine whether a linear hierarchy occurred among both sexes combined, where 0 = complete absence of linearity and 1.0 = linear hierarchy.

To determine whether social contact was initiated equitably by various age-sex class members, data was pooled and compared numerically. In order to reduce the chance of a biased sample, interactions involving infants as sole, obligate recipients (e.g., smelling infants) were eliminated from the accountable data set prior to analysis, because such interactions were due to innate nurturing constraints which are age-dependent. Moreover, such interactions accounted for a large subset of the pooled data.

Results

Dominance Hierarchies

Aggressive encounters were intricate in most cases and were characterized by a multiple suite of behavioral repertoires (Table 1). All behaviors are characterized by one (or more) types of agonistic behavior (i.e., general threat, contact threat, or vocal threat).

Distinct linearity appears to occur among both males, and among females (Table 2). However, when both males and females were combined, Appleby's (1983) test indicated non-significance for linearity; moreover, linearity was virtually absent ($N=7$, $K=0.07$, where 0 = complete absence of linearity and 1.0 = linear hierarchy). In order to determine whether one sex won more aggressive encounters than the other a Mann-Whitney test was used (STATGRAPHICS [STSC 1986]), but results were not significant.

Social Contact

Social contact was classified as little contact involved ($n = 5$ observed behaviors), unreciprocated contact ($n = 13$), and reciprocated mutual contact ($n = 10$). A total of 162 interactions were recorded, of which 49 represented little contact involved, 51 represented unreciprocated contact, and 62 represented reciprocated mutual contact (Table 3). The "mutual rub" (Sowls, 1984) was observed most frequently (22% [$n = 35$]), followed by

smelling ano-genital region (A-GR) (21% [n =34]) and "infant nuzzle" (Handen & Benirschke, 1991) by adult (13% [n =21]).

When behaviors where infants were the sole, obligate recipients were excluded from the accountable data set, the pooled sample equaled 91 interactions (Table 3). Of these social interaction, 62% (n =57) were initiated by adult males; 18.5% (n =17) were initiated by sub-adults; 13% (n = 12) were initiated by adult females; 4% (n =4) were initiated by sub-juveniles, and 1% (n =1) were initiated by an infant. Adult males initiated more social interactions than all other age-sex classes combined.

Discussion

Dominance Hierarchies

Taber et al. (1994) indicated that *Catagonus* defended areas territorially based upon negligible overlap between neighboring ranges and the presence of territorial overlap between neighboring marking stations. In contrast, Handen & Berischke (1991) indicated that *Catagonus* did not appear to evince a dominance hierarchy. Similarly, Mayer & Brandt (1982) observed only one encounter suggestive of prolonged dominance hierarchy in their study group. Packard et al. (1991) found group dominance among males in small groups of a closely related species, the collared peccary (*Tayassu tajacu*). Schweinsberg and Sowsls (1972) found that female collared peccaries were dominant over males.

Although previous studies of shorter duration found that tagua were passive creatures (Handen & Berischke, 1991; Mayer & Brandt, 1982), the findings herein are concordant with those of Taber (1994) that *Catagonus* is somewhat territorial. Most likely, the differences arising between these results and the previous assumptions of others were likely due to sampling duration. For example, dominance encounters were so scant and subtle that one year of data collection resulted in only 30 interactions (average of one interaction/12 days); Handen and Benirschke (1991) were unable to detect aggressive encounters in the same herd as their sampling session lasted for 18 days.

I hypothesize that a subtle hierarchical structure exists for behavioral efficiency. Hierarchical structure advances behavioral efficiency in social groups, through neurons being used by the dominant individual instead of all group members for a particular job (McFarland 1987). Concordant of this hypothesis, one animal in the study herd (not necessarily Alpha) was observed leading the herd from one area to another on several occasions.

Although results illustrated distinct linear hierarchies among males and among females, linearity was not distinct between males and females in the herd as a whole. Moreover, the number of encounters one sex wins over the other sex was not significantly different. Indeed, social order between sexes of *Catagonus* appears to be complex and remains largely unknown (Brooks, 1992). Regrettably, these results do little to shed light on the problem.

The polygynandrous mating strategy of the chacoan peccary (Brooks, 1992) explains the non-hierarchical nature between sexes. Because males do not tend harems, there is no direct reproductive benefit in attaining dominance over females. Inhibition of conception (Rutberg, 1986) is exhibited by adult female *Catagonus* (Brooks, 1992), and may only be possible when a female is dominant over a male.

Dominant females should have better access to food resources (Trivers, 1972; Rutberg, 1986) to benefit pregnancy. Concordant with this hypothesis, the Alpha adult female (Melinda) spent more time at the feeding site than any other adult (Melinda = 9 hrs., Pindua = 7.5 hrs., Bicicleta = 6.75 hrs. - Handen & Benirschke, 1991) and had the highest fecundity of all three adult females, being the only female that gave birth to quadruplets (Benirschke & Meritt, 1990). Increased fertility as a function of age and/or weight can both be ruled out, as Melinda was virtually the same age as the Beta adult female (Pindua) and weighed less than Pindua (Benirschke & Meritt, 1990); these findings are converse and concordant, respectively, with those of Rutberg (1986) for bison, another species of social ungulate. Therefore I hypothesize that dominance, more than age or weight, is important in allowing females better access to food resources to benefit pregnancy.

Social Contact

The results indicate that adult males in the herd are responsible for initiating most of the social interactions within the herd; this is strengthened even more when mean number of elicitations per individual are considered (Brooks, unpubl. data). Both sub-adults and adult females elicited more social interactions than sub-juveniles and infants. Although sub-adults elicited 1.4 times the number of social interactions which adult females elicited, this is relictual of the strong interfamilial group cohesion (Brooks, 1992) evolved in *Catagonus*. Next to adult males, sub-adults are more prone to sustaining group bonds when adult females are investing time in nurturing newborn young; births were aseasonal in the study herd (Brooks, unpubl. data).

Social contact is a major factor influencing the group bonding mechanisms that characterize this species. Indeed, these same processes are found in the other two Tayassuid species, although white-lipped peccaries (*T. pecari*) tend to elicit contact behavior among herd members more frequently than collared peccaries (Sowls, 1984). Additionally, low guttural grunts and olfactory cues aid in bonding, as vision is relatively poor (Mayer & Brandt, 1982). Group bonding initially evolved as a survival mechanism against predators in rainforest peccaries; subsequent benefits of this evolved social behavior include enhanced foraging efficiency (Kiltie & Terborgh, 1983), thermoregulation, and maintaining herd cohesion and integrity (Byers & Bekoff, 1981).

Although for eons group bonding apparently served as a beneficial survival tactic against natural predators (i.e., large felids), the same survival tactic is proving to be a very dear cost to *Catagonus* due to a completely different predator. For such a large species, the chacoan peccary is endemic to a relatively small biome. Moreover, the Chaco is being developed at an exorbitant rate (Benirschke et al. 1989). These factors contribute to the endangered status of *Catagonus* (Taber, 1993). Hunters consider *Catagonus* to be the tastiest meat of all Chacoan fauna. When a hunter shoots a herd member the remainder of the herd scatters, returning only moments later to "protect" the wounded herd member, whereupon the hunter shoots another and repeats the process until the entire herd is eliminated (Brooks, 1990; Taber, 1993). Indeed, kin selection is no match for firearms. Thus unsustainable harvest rates of this already rare species attributed severely to the decline of *Catagonus* (Taber, 1993).

Acknowledgments

I remain indebted to Dr. Kurt Benirschke; were it not for him, I would have never ventured

to Paraguay. The companionship of numerous individuals in Paraguay, including E. and S. Mueller, the Unger family, C. Yahngtze, M. Fox, F. Colman, Chaco Solar caballeros (Eduardo and Carlo), and some of the local Mennonites is hardly forgotten. Thanks to my immediate family, Richard, Claire, Lisa, and Greg, for supporting my interest in Latin American faunal studies. Numerous Paraguayan government organizations and NGOs supported Proyecto Tagua; Ministerio de Agricultura y Ganaderias, Servicio Forestal Nacional, Inventario Biologico Nacional, Cento de Datos para la Conservacion, and Fundacion Moises Bertoni. My gratitude is extended to K. Benirschke, J. Byers, N. Harvey, C. Johnson, S. Mayes, and L. SOWLS and several anonymous reviewers for making comments on this or previous versions of this manuscript. Financial Support was provided by Dr. Kurt Benirschke and the foundation for Endangered Animals. Local logistics were provided by the Zoological Society of San Diego through support of Proyecto Tagua (The Tagua Project).

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Table 1: Examples of Aggressive Encounters

Event (Type)	Exemplary Definition
Jump (GT)	A jumps at B.
"Squeal" (VS)	B emits "squeal" (M&B) vocalization.
"Follow" (GT)	A "follows" (B&B) B from FA.
"Whirl-around" (VT)	A "whirls around" and snorts at B.
Snort (VT)	A approaches FA and snorts.
"Flee" (D)	B SJ "flees" (M&B) from FA.
Stare Threat (GT)	A and B face to face.
"Squabble" (VT)	Mild "squabble" (M&B).
"Withdraw" (D)	A finishes feeding and "withdraws" (B&B). B takes over A' feeding site.
Competitive Grunt (VT)	A approaches B grunting, and tries to feed next to B.
Jaw Thwack Grunt (VT)	B opens mouth, and with an upscale grunt,
Jaw Thwack (CT)	thwacks jaw against A's neck.
"Withdraw" (D)	A "withdraws" (B&B), leaving B.
	A & B feeding rostrum to rostrum emitting soft, low grunts.
"Bite" (CT)	A softly "bites" (M&B) B's neck.
(GT)	B opens jaw and prepatates to bite A,
(GS)	but A releases bite-grasp, and B does not bite A.
Staccatoed Grunts (VT)	A emits a series of quick, rapid grunts,
Head Slice (GT)	followed by a quick, downward head slice,
(GS)	which inhibits B from entering FA. B may choose to enter from other (unblocked) side
"Withdraw" (D)	of A, or "withdraw" (B&B) area.

Head Slice (CT)	A snorts and swipes at B with head, targeting the highest degree of movement from the mouth area.
	A about to take food.
Stare Threat (GT)	B faces A and lifts head such that B is face to face with A.
“Withdraw” (D)	A withdraws from area. B consumes food item.
	In a single file line towards the FA,
Line Cut (GT)	A leaves its place in line and trots ahead to opportune feeding selection.
I Displacement (D)	I B is nuzzled away from FA by SA A's rostrum.
I “Butt” (CT)	I A runs up behind nursing I B, and “butts” B&B) B with snout. B is not displaced.
I “Butt” and Step (CT)	I A couples I “butt” (B&B) with stepping on ceases nursing
Nip (CT)	A ‘nips’ B on the nape.
“Withdraw” (D)	B withdraws from area.

AM = Adult Male GT = General Threat M&B= Myer & Brandt 1982

AF = Adult Female GS = General Submission B&B = Byers & Beckoff 1981

SA = Sub- Adult VT = Vocal Threat

SJ = Sub- Juvenile VS = Vocal Submission FA = Feeding Area

I = Infant CT = Contact Threat A = 1st in sequence

D = Displacement B = 2nd in a sequence

Table 2: Dominance Hierarchies of Individual Adults

Number of Male Wins

Subord.	Sap	Sam	Pri	Pac
Dominant				
Sapucaí	-	2	1	1
Sammy	0	-	4	2
Primeró	0	0	-	2
Pacu	0	0	0	-

Number of Female Wins

Subord.	Mel	Pin	Bic
Dominant			
Melinda	-	2	3
Pindua	0	-	1
Bicicleta	0	0	-

Number of Between-Sex Wins

Subord.	Mel	Sap	Sam	Pac	Pin	Bic	Pri
Dominant							
Melinda	-	0	2	1	2	3	1
Sapucaí	0	-	2	1	1	1	0
Sammy	0	0	-	2	1	0	4
Pacu	1	0	0	-	1	1	0
Pindua	0	0	0	0	-	1	1
Bicicleta	0	2	0	0	0	-	0
Primeró	0	0	0	2	0	0	-

Table 3: Social Contact Interactions of Different Age- Sex Classes

Little Contact Involved		# of occurrences/interactions			
Smelling A- GR (N=34)		AM	AF	SA	SJ
Smelling ano-Genital region of A by SA	AM	2	0	0	1
Wafting nose in the vicinity of the cleave.	AF	17	2	8	0
	SA	4	0	0	0
Smelling and/or Titlating I's A-GR (N=10)		AM	AF	SA	
Smelling and/or lightly licking A-GR of I.	I	2	2	6	
Smelling I (N=3)		AM	AF		
Smelling regino of I other than A-GR.	I	2	1		
Mutual A-GR Smell (N=1)		Individuals unrecognizable			
Two individuals simutaneously smelling on another's A-GRs.					
Facial Region Smell (N=1)		AM			
Two individuals mutually smelling facial region.	AM	1			
Unreciprocated Contact		# Occurences/Interactions			
“I Nuzzle“ by A (N=21)					
Described by Handen and Benirschke 1991.					
Precopulatory Behavior (N=6)		AM			
AM grappling AFs dorsal hair with chin or mouth.	AF	6			
Light Nose “Nuzzle Side” (N=6)		AM	SA	SJ	
Described by Byers and Beckoff 1981.		AM	0	0	1
	AF	3	1	0	
	SJ	1	0	0	
Sexually Stimulated Behavior (N=5)		AM	AF		
AM licks AFs A-GR, or female rubs side on	AM	0	2		
AMs posterior when walking behind him	AF	3	0		
Greeting (N=2)		AM			
General greeting nuzzle when two individuals encounter one-another.	AM	2			
Firm Nose “Nuzzle Side” (N=2)		AM	AF		
Described by Byers and Beckoff 1981.		AM	0	1	
	AF	1	0		

Unreciprocated Contact (con't) # Occurences/Interactions

Side Rub (N=2)		AM	SA	
One individual rubs nose lightly on another individual's side	AF	1	1	
<hr/>				
"Nuzzle Belly" (N=2)		AM	AF	
Described by Byers and Beckoff 1981.		AM	1	0
	AF	0	1	
<hr/>				
"Facial Region Nuzzle" (N=1)		SA		
One individual nuzzles nose on another individual's facial region.	AM	1		
<hr/>				
Posterior Nuzzle (N=1)		SA		
One individual rubs rostral area on another individual's posterior.	AM	1		
<hr/>				
Head Touch (N=1)		AM		
One individual lightly touches a resting individual's head	AF	1		
<hr/>				
Kiss (N=1)		AM		
One individual licks another individual's mouth.	AF	1		
<hr/>				
Forehead Rub (N=1)		SA		
One individual rubs forehead under another individual's chin	AM	1		

Reciprocated Mutual Contact # Occurences/Interactions

Mutual Rub (N=35)	Between all age-sex classes				
Described by Sowls 1984.					
<hr/>					
“Nose Check” (N=6)		AM	AF	SA	SJ
Described by Mayer and Brandt 1982.	AM	0	2	1	0
	AF	0	1	0	0
	SJ	0	0	0	1
	I	1	0	0	0
<hr/>					
Mutual Rostrum Nuzzle (N=5)		AM	AF		
Two individuals rub rostrums.	AM	2	2		
<hr/>					
Mutual Cleaning of SJ (N=4)		AM	SJ		
One individual cleans a resting SJ, who	AM	0	2		
reciprocally cleans front of rostrum	SJ	2	0		

Unreciprocated Contact (con't)**# Occurrences/Interactions****Mutual Neck Rub (N=4)****Two individuals rub necks vigorously.**

	AM	SA
AM	2	0
AF	1	1

Mutual Side Rub (N=3)**Two individuals rub sides lightly.**

	AM	SA
AM	0	1
AF	1	0
SJ	1	0

Mutual Nose-to-Side Rub (N=2)**Two individuals rub inner sides with noses.**

	AM
AM	2

Mutual Side Touch (N=1)**Two individuals touch sides while feeding.**

	AF
AF	1

Mutual Forehead Rub (N=1)**Two individuals mutually rub foreheads together.****individuals unrecognizable****"Rub Cheeks" (N=1)****Two individuals mutually rub faces together.****Described by Byers and Beckoff 1981.****individuals inrecognizable**

*individuals along the x-axis are initiators; those along the y-axis are recipients.

AM = Adult Male**AF = Adult Female****SA = Sub Ad****SJ = Sub-Juvenile****I = Infant**

Forget the Easter Bunny !



The AZA Bat TAG is currently selling full-color T-shirts for Easter featuring flying fruit bats against a landscaped background. TAG logo is printed on sleeve of shirt. Cost is \$14.00 for each shirt which includes S & H. Cost is \$13.00 each in quantities of three or more. Larger quantity discounts available. Please make check or money order payable to AZA Bat TAG and send orders to: Pete Riger or Kim Tropea, Mammal Dept., Wildlife Conservation Park Bronx, 185th & Southern Blvd., Bronx, NY 10460.



By Kayla Grams, Arizona-Sonora Desert Museum
and Gretchen Ziegler, Sequoia Park Zoo

This month's column begins with an observation made by Judie Steenberg at the AAZK conference, which we would like to paraphrase here. As keepers and the primary providers of enrichment, we must guard against limiting our concept of enrichment to only the techniques that stimulate *activity*. This is easy to do, since keepers (and everyone else) are so fond of seeing the animals "do something". We can forget that the behavioral repertoire of many animals consists mainly of inactivity such as dozing or digesting. Providing lots of stimulating enrichment is great for primates, bears and other active species but may create added stress for others. As Judy points out to frustrated tree roo keepers searching for more ideas, perhaps the best enrichment for these sedentary critters will consist mostly of several feedings per day and a regular supply of browse. Enrichment is in part the art of giving the animal back as much control over its life as captivity will allow. Basic choices such as temperature gradients, sun/shade, wet/dry, hidden/exposed, and a variety of spaces to occupy within the enclosure may be the most meaningful enrichment we can give. Thanks for the thought, Judy!

RED PANDAS: This idea began with keepers hanging a burlap bag (with top rolled so it was not so deep) from three points so there was an opening for the animal to climb inside, and supported the bag on a branch so it did not hang freely. They loved it! We added one for each animal. They did not mind whether the bag was supported on the bottom or hung freely. They preferred the bags deep, instead of shortened by rolling the top. Now we just hang the bags from one point on the wire cage side and they will climb up and search for the hole and sleep in it like a hammock.

(EDITOR'S NOTE: We'd like to hear about this idea tried with other animals as well. Send it in to the column!)

FEEDERS: With many of the feeding devices made by drilling holes into natural pieces of wood, we found them difficult to clean and disinfect. We use artificial plastic "logs" that we make from recycled plastic lumber which looks like real logs. Plastic lumber in boards, 4x4 square or round sections can be ordered from "The Plastic Lumber Co." based in Akron, Ohio. These feeders are easier to clean and disinfect, and can be ordered in natural colors.

--Danusia Castell, Keeper, Akron Zoo, Akron, OH

ENRICHMENT IDEAS

OBJECT: Apple raisin feeder

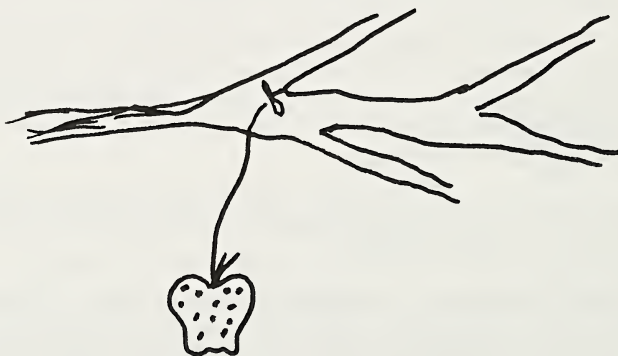
SUGGESTED ANIMALS: Golden lion tamarins,
Talapoins, Marmosets, Sakis

PURPOSE: New way to get a treat & eat entire device
afterwards.

MATERIALS NEEDED: String, nail, apple, raisins

ASSEMBLY: Polk holes (raisin sized) in apple w/nail.
Put raisins in these holes, hang from branch, etc.

DIAGRAM:



COMMENTS: This only takes about 5 minutes to set up.

PRIMATES: When I began searching for ideas for enrichment for our primates, I read a lot of the newsletter *The Shape of Enrichment*. I decided to try one of the ideas from the newsletter with our lemurs. This was to take a coconut, cut it in half, clean out the meat and drill a hole through the top of each half, then knot a string or cord through the hole so the shell can be suspended from a branch. I then used mashed banana, cooked yam or soaked monkey chow and pressed it into the inside of each shell. I hung the coconuts somewhere in the exhibit, slightly out of reach. This worked great for our lemurs. It lengthened their feeding time and it made them work for the food. I tried this idea on some of our other primates as well. It worked great for siamangs, spider monkeys and mangabeys. The mangabeys were more interested in how to take the coconut half off the string. It kept them very busy for quite some time and when they got the shell loose, they carried it around with them and ate out the food.

LOGGING ENRICHMENT: In order to keep track of enrichment useage and frequency, we use Enrichment Log Sheets, a separate sheet for each primate species. On the sheet, we note the date, the enrichment used and the animal's use and /or reaction to the enrichment. We use these sheets to log a new idea or one that has not been tried for awhile. We now know at a glance which enrichment has been used on what species and how recently that primate group received a new type of enrichment. We also have an "Enrichment Idea" notebook, which contains sheets with the following information: the enrichment, how to make it, how to use it, a sketch of assembly or finished product, materials required, the animals we've tried it with, the amount of time it takes to set up and any pros and cons of the idea (see example on adjoining page). These two systems keep us better organized, provide documentation of our enrichment efforts and we now have a reference for ideas.

- Michelle Muniz, Primate Keeper
Audubon Zoo, New Orleans, LA

Okay, everyone who wants to see some fresh ideas in this column: we need to hear from YOU!! We are rapidly running out of submissions, new ideas and repeats. Send us something today!

(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. Eds.)

Legislative Update

*Compiled by Georgann Johnston
Legislative Advisor
Sacramento, CA*



Federal Spending Bill Coupled to Continued Moratorium on Listing of Endangered Species

Congress passed a short-term spending bill on 26 January 1996 which would allow for the continued operation of the Interior Department and certain other agencies through 15 March 1996. The continued funding was made contingent on the continued enforcement of provisions of a measure regarding defense spending passed in May 1995 (reported here July 1995) which included the requirement of a complete moratorium on new endangered species listings.

Source: GREENLines, Issue #46, 29 January 1996. Published online by GREEN, the Grassroots Environmental Effectiveness Network

Proposed Change in Listing Status for Endangered Sea Turtles

The U.S.. Fish and Wildlife Service and the National Marine Fisheries Service are in the process of considering changes in the listing status for the olive ridley sea turtle and the green sea turtle. Both of these species are currently listed as threatened. The Endangered Species Act requires that at least every five years a review of the species on the list is to be conducted to determine whether its status should be changed by either removing it from the list, downgrading its status from endangered to threatened, or upgrading its status from threatened to endangered. Based on current information, the USFWS and the NMFS are considering increasing the status of both the olive ridley and green turtles to endangered. Further information about the status review can be obtained from Chief, Endangered Species Division, Office of Protected Resources, NMFS, 1315 East-West Highway, Silver Springs, MD 20910 or by calling Phil Williams (301) 713-1401 or Richard Byles (505) 248-6647.

Source: Federal Register 2 January 1996, vol. 61, no. 1

Germany Provides Funds to Kenya Conservation Programs

The government of Germany has decided to release 1.1 billion shillings to the Kenya Wildlife Service for conservation programs. The money is part of a total grant of 7.9 billion shillings pledged by a group of governments and private donors over a period of five years. David Western, Director of the Kenya Wildlife Service said that the money will be used to build and maintain roads in Kenya's parks and reserves.

Source: BBC Monitoring Service: Africa 16 January 1996, reporting on a news story aired by Kenyan KTN TV on 5 January 1996

Loggerhead Turtles in conflict with Greek Tourism

Zakynthos, one of the Greek Ionian Islands, attracts a quarter of a million tourists from Great Britain each year. Now, the government of Greece is in trouble with the Council of Europe, which alleges that Greece has failed to protect the interests of the loggerhead turtles which come to nest on the sandy beaches of the island. The turtle is an endangered species and virtually all living representatives use the Laganas Bay beach as a breeding site.

The Council of Europe, pursuant to the Bern Convention, has the power to appoint an outside arbiter to determine how the beaches should be managed. While Greek conservation groups are working to have the beach declared a national marine park, seafront businesses are pressuring the Greek government to avoid any action that would negatively impact their livelihoods.

The issue of the turtles has been brought to the attention of the Council of Europe at each of its annual meetings since 1986. While Greece enacted a number of protective measures to protect the turtles and the beach, they have not been too effective in enforcing the laws. Now, all of the interested parties — the Greek government, the business owners, and various environmental organizations — are awaiting the appointment of an arbitrator and, hopefully, some final resolution of the problem.

In the interim, volunteers from the Sea Turtle Protection Society of Greece, a nonprofit environmental organization, try to patrol the beach and educate tourists about the turtles. Their major opponents are the vendors who rent parasols and the operators of illegal taverns along the beach front. Over the past two years, the volunteers, working with governmental officials, have been able to secure the closure of many of the taverns, the implementation of a new six-knot speed restriction on boats in the bay, and a ban on night flights into Kalamaki airport. The result was a significant increase in the number of turtle nests in 1995.

Source: Reuter Textline Independent, 16 January 1996

New Mexico Buffalo Hunt Blocked by Federal Court

The State of New Mexico maintains a herd of buffalo at Fort Wingate, a U.S. Army base near Gallup, New Mexico. Late last year, nine hunters were selected by lottery to kill nine of the bulls in the 60-animal herd. The last public buffalo hunt in New Mexico occurred in 1884, when thousands of buffalo still lived in the state. By the turn of the century, only 500 bison were left in New Mexico and today there are a total of about 100,000 left in North America.

Upon learning of the scheduled hunt, local American Indian tribes were outraged that the animals they revered would be slaughtered to yield trophy heads for the hunters. Federal officials said the hunt could be held for the purpose of reducing the number of breeding-age bulls in the small herd. The American Indians and animal-rights activists took the matter to court, claiming that the U.S. Army should

have conducted an environmental impact study before allowing the hunt to occur on its land. A federal judge in Santa Fe agreed, blocking the hunt and issuing an injunction regarding the environmental impact report. The matter will return to the court later this year, for further argument on the issue of the EIR.

Source: Reuter Textline, The Times, 13 January 1996

Ruddy Duck Hunt Cancelled by United Kingdom Wildlife Advisory Board

A plan to cull vast numbers of the ruddy duck, a North American species which was transported to Great Britain and escaped into the countryside in the 1950's, was tabled by the government of the U.K. in January 1996. English Nature, the Government's wildlife advisory body, has decided that the time required and cost of carrying out the project are not justified by the relatively minimal problems engendered by the species.

The primary complaints about the ruddy duck come from Spain, which is concerned about its own rare and prized white-headed duck. It is claimed that ruddy ducks cross to Andalusia in Spain and mate with the native Spanish birds, producing hybrids which Spanish wildlife groups feel are contributing to the progressive extinction of the white-headed species. In Spain, it is generally open season on ruddy ducks, who are viewed as alien interlopers and are shot on sight.

English Nature decided to call off the cull when it began to receive negative comments from citizens who were concerned about the use of mass slaughter as a means to solve a fairly inconsequential problem. Other opponents of the cull stated that there is no direct evidence that the ducks in Spain actually come from Britain and that the U.K. residents and landowners should not have to bear the cost of controlling a problem which exists outside its geographical boundaries. For now, the British government has decided to call off the hunt, which was scheduled to occur in the Spring of 1996 in the English Midlands and in Wales.

Source: Reuter Textline, The London Times, 12 January 1996

Harp Seal Kill-Quota Increased by Canadian Government

Canadian Fishing Minister Brian Tobin recently expanded the 1996 seal kill quota to 250,000, a number higher than that seen in the peak seal hunting years of the 1970's and early 1980's. This is a substantial increase from the quota of 186,000 set for 1995, and the actual sealing toll of 67,000 for that year.

Tobin's action comes in response to a reported 99% decrease in the mass of spawning cod off the Atlantic coast of Newfoundland. The increased seal quota is an effort to appease out-of-work cod fishers who feel that the decrease in fish is directly related to the increased number of seals. In conjunction with the notice of the new quota, Tobin issued a statement claiming that the number of harp seals had doubled since 1983, to 4.8 million, and that seals eat 142,000 tons of Atlantic cod.

This statement was refuted by Paul Watson of the Sea Shepard Conservation Society and wildlife author Farley Mowat, who claim that there is no scientific data to show that harp seal populations have increased dramatically in the last ten years, nor is there any data to show that Atlantic cod constitute a major portion of the seal's diet.

The new quota would not affect the prohibition on killing whitecoats — seals less than two weeks old — but will allow for the slaughter of beaters — seals that are just beginning to molt and crawl.

Source: Animal People: News for People Who Care About Animals, Jan./Feb. 1996, Vol. 5, No. 1

Flamingos on the Increase in Iran, India and Pakistan

The government of the United Arab Emirates, through its Wildlife Management Unit, a department of the National Avian Research Center, has funded the undertaking of a research project with the goal of enticing flamingos to breed. Colonies of greater flamingos, both within the boundaries of the UAE and on Lake Rezaieyeh in north Iran, in east Pakistan and in western India are the subject of this undertaking. Ornithologists conducting studies in these areas have reported increased numbers of these rare birds in the southern Gulf during 1995. The UAE authorities say that the birds are being attracted to the area by recent heavy rainfall and environmental changes around the region, including the destruction of natural habitat around the Tigris and Euphrates rivers as a result of the draining of the marshlands by the Iraqi government. Other birds, including black winged stilts and eastern egrets are being seen in increasing numbers and the UAE is also investigating a method for encouraging these species to further colonize the area.

Source: Middle East Economic Digest 8 January 1996

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(Liaison and Information Network for Keepers)

Coordinator for the LINK System: Mark de Denus, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba, Canada R3P 0R5. (204) 986-6921 [w]; (204) 837-2916 [h].

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Vacancies exist for the following States or Provinces: Alaska, Arizona, Southern California, Hawaii, Iowa, New Mexico, Mississippi, Nebraska, Utah, Ontario and Quebec.

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks / AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.

CHILDREN'S ZOO DIRECTOR...BS in Biology/Zoology with experience preferred. Eight-acre facility with 23 animal exhibits. Three part-time zookeepers with 15 seasonal part-time employees. Responsible for animal care, zoo operation with special emphasis on educational programming and marketing. Must have creativity and a vision for the future. Salary commensurate with experience. Please send letter, resumé, and three references to: Saginaw Valley Zoological Society, Saginaw Children's Zoo, 1720 S. Washington, Saginaw, MI 48601; Phone (517) 759-1408. Open until position filled.

ZOOKEEPER/AQUARIST...requires degree in biology, zoology, or related field or equivalent experience. Experience with aquatic birds, reptiles, freshwater or marine animals required. Must be SCUBA certified. Willing to work as a team member in a biome concept aquarium. Good mechanical, organizational, communication skills desired. Send cover letter, resumé, references to: Mary Jane Bennett, Director of Human Resources, Indianapolis Zoo, 1200 W. Washington St., Indianapolis, IN 46222.

ANIMAL SHOW PRESENTER...requires at least two (2) years paid experience in a related position. Applicant must possess strong public communication and animal handling skills working in a six-member show department using birds, mammals and reptiles in educational and entertaining presentations. Salary \$7.00 - \$8.00/hr. Insurance options and profit-sharing plan available. Send resumé to: Caribbean Gardens, Show Staff Supervisor, P.O. Box 7129, Naples, FL 33941-7129. We are a drug-free workplace.

BIRD CARE SPECIALIST...requires a minimum of one year paid experience. Candidate must be a team player who can work with a minimum of supervision. Duties include care and feeding of many species of birds, incubation supervision, and hand-feeding. Salary and benefits commensurate with experience. Send or fax resumé and references to: Richard L. Miller, DVM, 5700 S.W. 130th Ave., Ft. Lauderdale, FL 33330. Ph.# (305) 434-8599, FAX# (305) 434-4889.

The following two (2) positions are available at Soco Gardens Zoo. Send resumé and references to: Soco Gardens Zoo, Attn: Jim Miller, Rt. 1, Box 355, Maggie Valley, NC 28751. Resumés taken until positions are filled.

ZOO KEEPERS...two immediate full-time openings. Seeking mature, responsible keepers who would enjoy working in a small zoo setting with a small keeper staff. Requires high school diploma, paid zoo and practical exhibit construction experience. Applicants must be able to work well with the public and staff. Willing to work most weekends and holidays. Duties include but not limited to animal and reptile care, exhibit maintenance and construction, and lecturing to the public. Salary \$15,000.00 - \$17,000.00, commensurate with experience, plus health insurance.

SEASONAL KEEPER/GUIDES...May - October, six days per week. Prior paid zoo experience preferred but volunteer experience acceptable. Applicants must be neat in appearance, have audible voice, work well with co-workers and public. Duties include

but not limited to giving tours to the public, all aspects of animal care. Must be willing to work with non-venomous and venomous reptiles. Salary \$190.00 per week, plus uniforms, lodging and utilities.

ZOOKEEPER - *Psittacines*...requires minimum of one year paid, hands-on experience with Macaws and degree or equivalent zoo-related experience. **Mammals** - requires minimum of one year paid, hands-on experience with ungulates and felines and degree or equivalent zoo-related experience. Duties for both positions include daily care, feeding, habitat upkeep, breeding programs, record-keeping, medical coordination, training, acquisitions, supervising part-time staff/volunteers, and presenting educational programs, etc. Must be willing to work weekends/holidays. Starting salary \$15,000.00 - \$20,000.00 with year-end bonus and benefits. Excellent growth potential. Salary commensurate with experience. Send resumé/references to: Washington Zoological Park, 19525 SE 54th, Issaquah, WA 98027. Fax (206) 392-1076. Positions open until filled.

INTERNSHIP...the Miami Valley Serpenterium, a nonprofit organization, is seeking student interns for the 1996 fall season. MVS is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The intern will assist in the captive maintenance of the zoo's reptile collection, collect admissions in the exhibit, give interpretive talks and interact with the public, assist with educational outreach programs, and perform other duties as assigned. In addition the intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern **will not be involved** in the handling of any venomous reptiles. Desirable qualifications include a willingness to handle snakes and other reptiles on a daily basis, ability to communicate effectively with people, good writing skills, orientation to details, and self-motivation. Students majoring in the biological or natural sciences are preferred. Former interns have arranged for academic credit with their colleges or universities. Salary and benefits include experience with the most extensive and diverse collection of snakes in the area, housing, and \$55/week in pay. Personal transportation is recommended. Starting dates are flexible, but a minimum commitment of three months covering September-November is required. to apply send cover letter and resumé to: James R. Harrison, Executive Director, MVS Reptile Zoo, 1275 Natural Bridge Rd., Slade, KY 40376. **Deadline** for Fall applications is **15 June 1996**.

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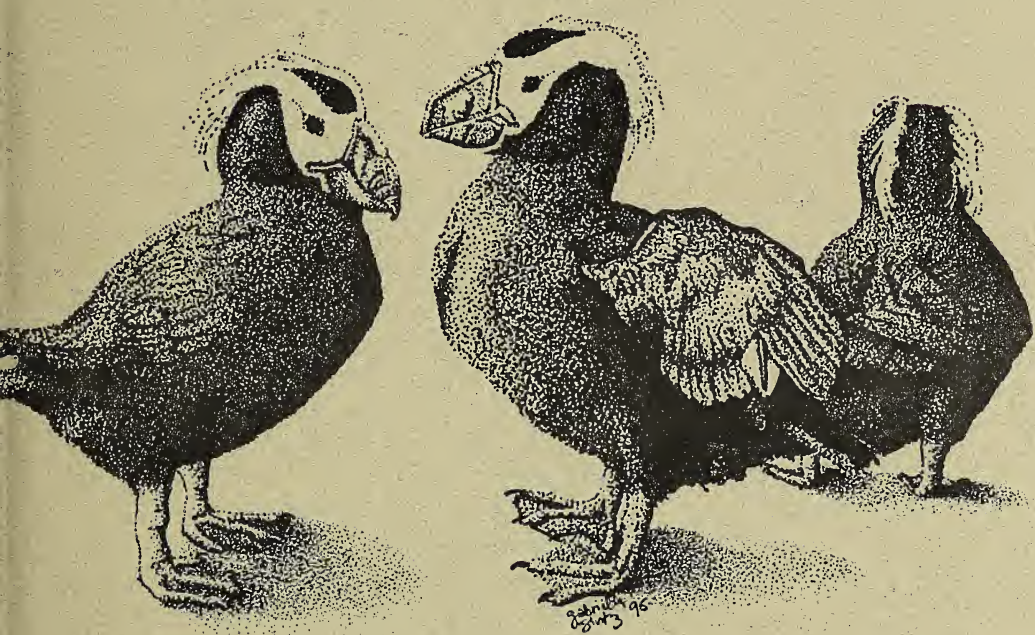
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The Journal of the American
Association of Zoo Keepers, Inc.

APRIL 1996

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Denver Zoo (Amphibians)

Diet Notebook, Mammals, Vol. II - Susan Bunn Spencer, Rockford, MI

Incubation Notebook Project - Scott Tidmus, Sedgewick County Zoo, Wichita, KS

Exhibit Design Resource Notebook - Mike Demlong, The Phoenix Zoo, Phoenix, AZ

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About the Cover.....

*This month's cover art of Tufted Puffins (*Lunda cirrhata*) was submitted by Gabrielle Sivitz, Assistant Manager/Head Keeper at The Academy of Natural Sciences in Philadelphia, PA. Native to the North Pacific, the tufted puffin weighs around 850g with a body length of 38-41cm. Because of its prominent, brightly colored beak, the puffin is often called a sea parrot or the clown of the seas. The puffin nest is a borrow with a small room at the end - they will often take over rabbit burrows for nesting. When the chicks are about six weeks of age, the parents return to the sea and the chicks must fend for themselves. The puffins come to land only to breed. Thanks, Gabrielle!*

Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm]) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

Deadline for each regular issue is the 10th of the preceding month.

**Dedicated issues may have separate deadline dates
and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by AAZK, Inc.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

Scoops & Scuttlebutt



Chapter Donations Gratefully Acknowledged

The Board of Directors and the Staff of AAZK, Inc. wish to thank the following Chapters which have very generously made donations to the Association in conjunction with their rechartering: For General Operating Expenses - Los Angeles Chapter AAZK (\$200), Greater Kansas City AAZK Chapter (\$200), North Carolina Chapter AAZK (\$200), AAZK Virginia Chapter (\$100), South Florida AAZK (\$100), and the Chinook Chapter AAZK of Calgary, Canada (\$50). A donation of \$25 was made by the Indianapolis AAZK Chapter and designated for helping to fund the CPR Grant Program.

The Central Florida Chapter AAZK held a Wildlife Poster Raffle and donated \$100 from the profits to the general operating budget of the Association. The posters for the December auction were donated to the Chapter by T. A. Strawser.

The AAZK Caldwell Chapter of Tyler, TX donated \$100 towards the publication costs of the AAZK Operations Manual which delineates the policies and protocols of AAZK, Inc.

AAZK, Inc. sincerely appreciates the willingness of these Chapters to assist in helping with the funding of the Association and ensuring that it continues to grow and serve its members.

Thanks and Assistance Request from the Macaw Recovery Project

A special thanks to Jenny Brown from the Rio Grande Zoo for getting and delivering donated macaw hand-rearing formula and to Greg Callahan from the Boise Zoo for delivering an incubator and medical supplies to *Amigos de las Aves*, Macaw Recovery Project, Costa Rica. We still need volunteers to bring us much-needed supplies from the U. S. If you will be traveling to Costa Rica and can help, please contact us. G. Suzanne Chacon, Avian Propagation Specialist, FAX 011-506-441-2658 or by mail service at P.O. Box 25216, SJO-465, Miami, FL 33102-5216.

Undergraduate Training in Zoo Studies Offered

Friends University, in association with the Sedgwick County Zoo, Wichita, KS, is offering undergraduate training in *Zoo Science*. A Bachelor's of Science degree is awarded at the completion of this unique, fully-accredited four-year program which combines course work and practical work experience at the zoo. Courses taught at the zoo by zoo staff members focus on modern zoo functions and missions, animal management in captivity, horticulture and exhibit design. For

further information, contact Alan Maccarone, Biology Department, Friends University, 2100 University, Wichita, KS 67213. Phone: (316) 261-5890.

Japanese Group Seek Help in Replacing Items Lost in Earthquake

Zoo/DEL - the Zoo Design & Education Lab of Kobe, Japan suffered severe damage in the devastating earthquake which rocked that city in January of 1995. Following the initial quake loss, more of the materials which had been painstakingly gathered over many years were lost or damaged by the torrential rains which followed the quake. They are now asking for your help in replacing some of the lost items. They are particularly interesting in getting back issues of zoological society magazines and annual reports; special commemorative items issued at the opening of a new exhibit or for a particular zoo anniversary; posters and guidebooks from zoos; any AAZK Chapter patches; a 25th AAZK Anniversary coffee mug; any special event or new exhibit T-shirts, etc. If you or your facility is able to donate any of these items to help Zoo/DEL recover from its earthquake losses, it would be most appreciated. You may send items to: Zoo/DEL 2-15 Nagate, 1-chome, Nada-ku, Kobe, Japan - attn: Yoshi. Yonetani. If you are unable to send them yourself, you may send them to AAZK Administrative Offices and we will attempt to secure funding for the overseas postage costs. Many thanks.

Correction on BFR Donation

In the March issue under the Bowling for Rhinos Update, the donor of the rhino sculpture which will go to the third highest money raiser was incorrectly identified. Tony Nichols (named as the donor in the article) did in fact receive the item, but it was generously donated by Helen Brauer of Ft. Collins, CO. Mrs. Brauer donated the piece in memory of her late husband, Herb Brauer, who had a keen interest in rhinos and their conservation. A further explanation by Tony Nichols along with some tips for BFR Chairmen in relation to dealing with donors will appear in next month's issue of *AKF*.

Coming Events

17th Biennial Pronghorn Antelope Workshop - June 5-7, 1996 at Kings Beach, CA. For information contact Laura Colton at (916) 653-6886 or Fax (916) 653-1019.

1996 Central Regional Volunteer Conference - August 2-3, 1996 at Sioux Falls, SD. Hosted by The Great Plains Zoo and Delbridge Museum. For information contact Jackie Goosen or Vanessa Lambert at (605) 367-7003 or fax (605) 367-8340.

ZOOMANIA - 96 - Southeast Regional Docent Conference - September 13-15, 1996 at Gulf Breeze, FL. Registration and hotel information available by contacting the Docent Council or Curator of Education at THE ZOO (904) 932-2229, ext. 27.

Association of Zoological Horticulture International Conference - October 4-12, 1996 in Greensboro, NC. For further information contact Corinne Benbow, North Carolina Zoological Park, 4401 Zoo Pkwy., Asheboro, NC 27203.

Message from the President

Greetings from the Lone Star State!

The AAZK Membership Drive is in full swing. There is still plenty of time for a lucky individual to win an exciting Grand Prize - a trip to beautiful Houston, TX for the 1997 AAZK National Conference. I have heard that many Chapters have initiated their own local membership drives. I commend you and can hardly wait for the totals to come in. If each current AAZK member got one new person to join, the Membership Drive would be an outstanding success. So take an individual pledge and encourage your colleagues, docents, and volunteers to become members of AAZK. A membership plug can be offered during career day presentations and remember to photocopy enough of the special membership drive forms to have on hand.

Please pay special attention to the *AKF* announcements for the AAZK Awards Committee. There may be a colleague working with you who deserves to be recognized for his or her determination and commitment to professional animal care. Criteria for nomination for the five awards which AAZK presents may be found in the January through April 1996 issues of *AKF*. Deadline for nominations is 1 June 1996.

Finally, Spring is here throughout most of the nation. The Southern States are welcoming many spring-breakers to our beautiful beaches and sunshine. The AAZK Board of Directors made their mid-year migration to the AAZK Administrative Offices in Topeka, KS from 28-31 March. Highlights of this meeting will be in the May issue of *AKF*. Good luck to all Chapters gearing up for Bowling for Rhinos events. Just think, the AAZK National Conference in Detroit is right around the corner. Hope to see you there!

Sincerely,



Ric Urban, President AAZK, Inc.
Houston Zoological Gardens, Houston, TX



AAZK Award Nominations Are Now Being Accepted for 1996!

The AAZK Awards Committee is accepting nominations for the **Lifetime Achievement Award (LA)** to be presented at the 1996 AAZK Conference in Detroit, MI. The deadline for all award nominations is **1 June 1996**. Information concerning the qualifications, nomination procedure, selection procedure and an explanation of the awards may be obtained by contacting Janet McCoy, Chair, AAZK Awards Committee, Washington Park Zoo, 4001 S.W. Canyon Rd., Portland, OR 97221.

LIFETIME ACHIEVEMENT (LA) Award

The American Association of Zoo Keepers, Inc. (AAZK) is the administering organization of the Lifetime Achievement Award presented by the AAZK Awards Committee. This award is to be given at the end (retirement) of a keeper's career. The purpose of the award is to recognize outstanding commitment to professionalism as a zoo keeper over a long period of time, and significant contributions to the community.

The character of the award includes; a plaque, letter of notification to the institution's director and national recognition by professional journals. Such journals include: the American Zoo and Aquarium Association (AZA) and the Canadian Association of Zoological Parks and Aquarium (CAZPA) Newsletters, Animal Keepers' Forum (AAZK), Awards, Honors and Prizes: Volume 1; United States and Canada. The latter is published by Gale Research Company based in Wheaton, MD and found in medium to large sized libraries across the U.S. and Canada.

The Lifetime Achievement Award was established by the 1993 Awards Committee, Janet McCoy, Chair. Rachél Rogers proposed the award to the AAZK Board of Directors. The award is presented at the annual AAZK National Conference.

Qualifications:

1. The nominee **must** be a full-time keeper retiring from a career of zoo keeping and employed in any North American zoological institution, aquarium or related facility.
2. The nominee must have been employed at least twenty years on permanent status at a zoo, aquarium or related facility.
3. The nominee **must** be nominated by **two** of his or her peers who have also been employed at that same zoo, aquarium or related facility. Supporting nominations may be submitted by management personnel from the same institution.

Nomination Procedure:

1. List name, position, institution's name, address, phone and Director, years of service in the field and the recommendation of peers or colleagues.

2. List and **document** outstanding achievements: exhibits, breeding, education, project participation, papers, etc. **Verification** of these facts must be signed by the zoo director, curator, or immediate supervisor of the individual being nominated.

3. Describe extra activities outside of zoo, aquarium or related facility work: working with conservation groups, animal related youth groups, rehabilitation wildlife officials, etc.

4. Paragraph of why the nominee fits the criteria.

5. Provide 3 - 5 references.

6. Deadline for nominations is **JUNE 1st** of each year.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.

BOWLING FOR RHINOS PIN

Available from the Portland Chapter

Show your support for **Bowling for Rhinos** with this 3/4 inch, five-color enamel pin. Cost is \$3.00 each or save on orders of 25 or more at a cost of \$2.00 each. Send requests for pins to:

Portland Chapter AAZK
Metro Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, OR 97221
(503) 226-1561, Ext. 255
Fax (503) 226-0074



Births & Hatchings



Kansas City Zoo (Kansas City, MO)...announces the following B&H for January 1995 through February 1996:

Mammals - 5.3 Rock hyrax (*Procapra capensis*) [1st for facility/3.2 DNS]; 1.1 banded fox (*Otocyon megalotis*) [1st for facility/DNS]; 4.1.9 slender-tailed meerkat (*Suricata suricatta*) [0.0.9 DNS]; 0.0.8 red kangaroo (*Megaleia rufa*) [T]; 3.2 Besia oryx (*Oryx gazela besia*) [1st for facility/1.2 DNS]; 2.1 Thompson's gazelle (*Gazella thosoni*) [2.0 DNS]; 4.2.1 impala (*Aepyceros melampus*) [1.0.1 DNS]; 1.0 Nile lechwe (*Kobus megaceros*) [1st for facility/DNS]; 1.0.2 elk (*Cervus elaphus canadensis*); 5.1 greater kudu (*Tragelaphus strepsiceros*) [1st for facility/3.0 DNS]; 1.0 Reeve's muntjac (*Muntiacus reevesi*); 2.1 sable antelope (*Hippotragus niger*) [1st for facility/0.1 DNS]; 1.0 Masai giraffe (*Giraffa camelopardalis tippelskirchii*) [DNS].

Birds - 0.0.1 Sudan golden sparrow (*Passer luteus*); 0.0.5 Cordonbleu (*Uracinthus cyanocephala*); 0.0.8 straw-necked ibis (*Carphibis spinicollis*); 0.0.1 Victoria crowned pigeon (*Goura victoria*) [CITES II/DNS]; 1.0 Temmick's fruit dove (*Ptilinopus porphyrea*) [CITES III]; 0.0.13 white-buck mousebird (*Colius colius*); 0.0.2 Goldies lorikeet (*Trichoglossus goldiei*); 0.0.2 Mandarin (*Aix galericulata*) [0.0.1 DNS]; 0.0.1 cackling Canada goose (*Branta canadensis minima*); 0.0.1 silver-eared mesia (*Leiothrix argentauris*) [DNS]; 0.0.2 red-tailed laughing thrush (*Garulax milnei*) [DNS]; 0.0.1 wompoo fruit dove (*Ptilinopus magnificus*) [CITES III/DNS]; and 0.0.1 red-headed finch (*Amadina erythrocephala*).

Reptiles - 0.0.2 South American red-footed tortoise (*Geochelone carbonaria*). submitted by Shirley Williams, Lion / Kopie Keeper, Kansas City Zoo, Kansas City, MO.

Little Rock Zoo (Little Rock, AR)...announces its B&H from July to December 1995:

Mammals - 1.0 Reeves muntjac (*Muntiacus reevesi*); 0.3 scimitar-horned oryx (*Oryx dammah*); 2.7 capybara (*Hydrochoerus hydrochaeris*); 1.0 guanaco (*Lama glama guanicoe*); 0.1 reticulated giraffe (*Giraffa camelopardalis reticulata*); 0.0.2 spider monkey (*Ateles geoffroyi*); and 1.0 Chimpanzee (*Pan troglodytes*). [DNS].

Reptiles - 0.0.8 Mexican milksnake (*Lampropeltis triangulum annulata*); 0.0.4 Mexican cantil (*Agkistrodon bilineatus*); 0.0.3 Baird's ratsnake (*Elaphe obsoleta bairdi*). submitted by Marie Schmude Greene, Chapter Liaison, Little Rock AAZK.



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Exhibit Design Resource Notebook... An Update

A few of your keeper peers have embarked on an important and ambitious project, the Exhibit Design Resource Notebook (EDRN). Our objective with this project is to survey and document existing animal exhibits at zoos, aquaria, living museums, and conservation centers across North America. Like other AAZK sponsored publications (e.g. Zoo Infant Development Notebook), the EDRN will be of immense value to keepers, curators, architects, and others who participate in the design or fabrication of animal exhibits. The EDRN is intended as a reference for facilitating the creation of, or improvement of animal exhibits. The EDRN can never provide a substitute for a comprehensive exhibit research program.

Currently, we have on file over 250 completed survey sheets on mammals, birds, reptiles, amphibians, invertebrates, and fish, but we can use twice that number. In order to do this, we need information from you institution! You can help by completing one or more of our survey forms on those exhibits that you feel function particularly well (from an animal, caregiver, and visitor perspective). The survey form takes approximately 15-20 minutes to complete and your altruistic act will greatly benefit others.

When sufficient forms on all animal taxa have been gathered, we will publish the results in either a loose-leaf notebook format, on computer disk, or by individual species request. We hope to begin making this information available early this summer. Since the EDRN is a dynamic, continually evolving project, we will always be accepting new survey forms for this project. We do ask however, that you return completed data forms within 60 days of your original request.

If you or your institution would like to participate, need a form, or have questions, please contact me at the address below.

P.S. A big thank you to those of you that have sent in completed forms.

Mike Demlong
AAZK EDRN Coordinator
The Phoenix Zoo
455 North Galvin Parkway
Phoenix, Arizona 85008-3431
(602) 914-4373



EDRN

Bowling for Rhinos Update

*Patty Pearthree, National BFR Coordinator
Indianapolis, IN*



In 1995, BFR raised \$120,600.00 for Lewa Wildlife Conservancy-LWC (formerly called Ngare Sergoi rhino sanctuary) in Kenya and for Ujung Kulon National Park in Java, Indonesia. The first \$100,000.00 will continue to support LWC with the remainder each year going to Ujung Kulon.

BFR funds will be used to partially pay the nearly \$400,000.00 operating costs of LWC. This includes such things as the purchase of new vehicles to patrol the sanctuary, along with salaries for the security guards who keep the wildlife of Lewa safe. The \$20,600.00 for Ujung Kulon will be used to either purchase a new patrol boat (the best mode of transportation for this rainforest peninsula) or build a new guard post in a more strategic location. I am currently waiting to receive word on which of these two items is more desperately needed.

I have received many inquiries from individuals who would like to join the nearest Bowl-A-Thon. In order to help them, I need to know when each Chapter will hold their event and the current contact person to give these individuals. **If you have not already given me this information, please do so at your earliest convenience.** I also have BFR posters for anyone holding an event. The artwork for these posters was designed and donated by Christine Joy Pratt of XY Design in Honolulu, HI.

Anna Merz, founder and patron of Ngare Sergoi Rhino Sanctuary, has decided to retire to South Africa and left Lewa the first of this month. She has been looking forward to retirement for some years now, but with the deaths of Samia and Samuel, she felt now was the time. She will continue to support LWC as always, continue to do fundraising talks/tours for LWC, educate on the plight of the rhino, and will make her home at Lewa for a few months each year. She will now be able to enjoy a more comfortable life and attend cultural affairs such as musicals, plays and the opera with a new set of friends. She will be missed at Lewa but everyone knows she is well deserving of retirement life. With BFR and Anna's continued support, LWC will continue to be the success story of Kenya.

The administration of BFR has changed slightly over the last year, but this should not affect the event except to make it run more professionally. The administrative costs will no longer be covered by the Ngare Sergoi Support Group, but will be covered by AAZK, Inc. and LWC. A formal agreement has been signed by these parties to ensure the future of the project. Due to these adjustments, please note the changes in the **Rules to Win the Trip**.

"Bowling for Rhinos Sanctuary" Trip Rules

1. The top two money raisers each year in "Bowling for Rhinos" will each win a two-week trip to the Ngare Sergoi Rhino Sanctuary near Isiolo, Kenya.
2. The two (2) individuals will visit the Sanctuary together and arrange their trip with the assistance of the BFR Coordinator and through the Administrative Office of AAZK, Inc.
3. The two winners may each bring a guest, but the guest must pay their own expenses and be able to lodge in the same room as the winner.
4. The winners' trips are paid for from a fund administered by the Lewa Wildlife Conservancy and AAZK, Inc. These funds are derived from 4% of the yearly BFR monies raised and/or funds contributed by LWC and AAZK, Inc. The allowance for each plane ticket shall not exceed \$1700 (1996).
5. The winners **must** be a paid, National AAZK members at the time of their bowling event.
6. The same person can only win the trip once. This is to encourage more people to try to win, and give an opportunity for more people to visit the Sanctuary and see the benefit of their hard work.
7. Canadians count their total funds raised in Canadian currency. Therefore, if a Canadian member raises \$5,000 but it only equals \$3,000 in U. S. dollars, the \$5,000 amount counts in the contest.
8. Only money which is turned in to the BFR National Coordinator **by 1 September** of the same year can be counted in the contest.



Bowling for Rhinos is not limited to just bowling. Some other BFR funds are raised through "Rock n' for Rhinos", "Rummage for Rhinos", "Run for Rhinos", "Recycle for Rhinos", or donations. If you have any questions, please call me at (317) 322-8723. Funds raised should be submitted in the forms of checks made out to AAZK, Inc. Please mark "For Deposit Only" on the back of your check before mailing them. This will ensure that they cannot be cashed except by AAZK, Inc. Mail checks to: Patty Pearthree, c/o Bowling for Rhinos, P.O. Box 199026, Indianapolis, IN 46219-9026.

As so many of you will be aware, total disaster befell Samia and her baby very soon after I completed my last newsletter. Both fell over a 40 foot cliff on the night of the 21st November 95. Both died; my beloved Samia instantly and little Samuel broke his back and had to be shot. The cause of the tragedy is known only to the trees, rocks and stars and they guard their secret. Her tracks and those of her mate, Kenu, were together on top of the cliff. Did they love, fight or play? We shall not know.

Three months have now passed but the pain of their loss has not. I miss them both all the time. But I have, however, been both comforted and astounded by the incredible outpouring of compassion their death has provoked. I have received over 200 wonderful letters, cards and faxes. I hope I have replied to everyone personally, but anyone who wrote and has not heard from me, please accept my heartfelt gratitude for the courage you have all given to me. It makes me feel that perhaps Samia's life and my love for her have not been in vain and that all of you who have cared enough to write to me will also care enough to ensure the continuation of her species on the beautiful earth for the next millennium. I am also deeply grateful that the documentary film made about her by Jack and Pauline Bollamy for BBC Wildlife was completed and will be shown in the late spring, narrated by David Attenborough. I hope so much that it will show the whole world what wonderful animals rhinos are and make people care for them enough to create the political and economic pressure needed to ensure their survival.

Here at Lewa our work has to go on. The November rains having virtually failed, we are terribly dry and longing and hoping for rain in April. On the 24th January the young black cow, Juniper, herself born here in 1988, produced her first calf. She is being an excellent mother. The three calves born last year to Morembo, Solia and Stumpy also continue to make good progress.

This week the team of volunteers brought by Janet and Spencer Golsthorpe of the Guernsey Rhino Trust arrived and have already laid the foundations for our new clinic. Last year they built a clinic for the Lake Nekuru Rhino Sanctuary. We are so lucky that this year it is our turn. Ten cases of supplies and medical equipment have already been donated by Dr. Marjorie Harmon's Support Group in Springfield, MO, and six more cases are enroute. The clinic is expected to cater to some 500 people on completion, but half will be our own people and the other half our neighbors. It will be under the supervision of Dr. Harmon. The nurse who it is hoped will staff it is now completing her training with AMREF.

So, despite tragedies our work must go on and I hope you will all continue to give us your support and encouragement, and I would thank once more all of you who have written to me for your caring and kindness. We will not let Samia's life be in vain.

--Anna Merz

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\$19.95 \$15.75 **Bring Back the Birds** by Russell Greenberg and Jamie Reaser - What you can do to save threatened species. Favorite songbirds are among those disappearing from our forests and meadows. Bird watchers will find out all the information they need to work for their recovery. 288 pgs. Maps, line drawings. Paper.

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\$20.00 \$16.00 **Let the Mountains Talk, Let the Rivers Run** - A Call to Those Who Would Save the Earth by David Brower with Steve Chapple. David Brower, the first Executive Director of The Sierra Club, discusses the mistakes he wished he had not made and the strategic flourishes that have earned him countless fans and enemies alike. This book is printed on a tree-free paper called kenaf which is made entirely from the hibiscus plant. Hardcover. 192 pgs.

\$18.95 \$15.15 **How to Make the World a Better Place** - 116 Ways You Can Make a Difference (Revised Edition) by Jeffrey Hollender and Linda Cattling. This updated edition shows how just one person can make a difference. 320 pgs., paper.

TO ORDER: List the books you want along with your name and complete mailing address. Include shipping fee of \$2 for the first item and \$1 for each additional item. Make checks or money orders payable to "AAZK Book Sale" (U.S. FUNDS ONLY - no cash or CODs, please. Domestic orders only. Please allow 6-8 weeks to receive your order. Mail orders to: AAZK Beardsley Chapter, attn: Jeanne Yuckienuz, 1875 Noble Ave., Bridgeport, CT 06610-1600. Contact person: Jeanne Yuckienuz (203) 576-8126.



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Book Review

The Black-tailed Prairie Dog: Social Life of a Burrowing Mammal

By John L. Hoogland, 1995

The University of Chicago Press

5801 S. Elis Ave., Chicago, IL 60637

Paperback, 558pgs. \$34.95

*Review by Robert Berghaier, Animal Keeper
Philadelphia Zoo, Philadelphia, PA*

The black-tailed prairie dog is one of the most frequently exhibited animals in North American zoos. They also appear to be very popular with zoo visitors. Prairie dogs make an active exhibit and the social interactions, of these communal ground squirrels tends to hold a spectators interest. Most zookeepers however, cannot begin to imagine the complex life style of this burrowing rodent

The Black-tailed Prairie Dog is the newest addition to the excellent behavioral biology series published by the University of Chicago and edited by George Schaller. This set of books includes such titles as The Serengeti Lion, The Spotted Hyena, and The Mountain Gorilla all of which are considered the definitive work on the species they cover. After reading John Hoogland's book, I feel that The Black-tailed Prairie Dog will be accorded the same status as the aforementioned texts.

Hoogland has written a detailed and often fascinating account of his sixteen years of research with this species at Wind Cave National Park, South Dakota. Dr. Hoogland and his field assistants logged and amazing 1,991 days and 73,210 person-hours of observation during this time period. All that data had been used to compile what has to be the most detailed long-term study of any social rodent.

The book is organized into 17 chapters covering all aspects of Hoogland's research. Chapters 1 through 4 deal with the natural history of all species of prairie dogs, as well as the black-tailed, and examines the study site and the methods Hoogland used to collect his data. Chapters 5 through 16 examine the behavioral and social biological implications of his observations. For example, did you know that some female black-tailed prairie dogs commit infanticide on the juveniles of neighboring females? Or that a few months later that same female may nurse not only her own pups but also the surviving offspring of her neighbors, the very pups she was trying to kill previously? The final chapter covers the conclusions on the behavioral ecology of prairie dogs that Hoogland has drawn from his study. The book contains numerous photos, graphs, drawings, and two appendixes which help to clarify the text. Each chapter also contains a helpful summary which reviews the concepts that Dr. Hoogland emphasizes.

This book would be a valuable addition to any zoo's library or to the book collection of any animal keeper or curator who works with this species. The text would also be useful to anyone who wants to embark on a long-term behavioral study of captive or wild animals. Dr. Hoogland goes into a great deal of detail on how he developed and modified his research methods to examine the complex issues his study raised. In many ways this is a "how to do it book" as well as a "this is what I found out" type of study. I also feel that this book would be very valuable to those in our profession who work with the black-footed ferret. Hoogland raises some interesting questions on how these two species may have interacted and perhaps co-evolved before the demise of the ferret due to control efforts made on the black-tailed prairie dog.

1997 Gorilla Workshop Planned

The Pittsburgh Zoo is pleased to announce that we will be hosting The Gorilla Workshop April 2-6, 1997. Projected topics will include advances in husbandry techniques, exhibit design, veterinary care, cutting-edge enrichment methods, and *in-situ* and *ex-situ* research. Registration packets will be available in the near future. For further information, contact Debra McGuire or Roseann Giambro; Telephone (412) 665-3794; Fax (412) 665-3661.

Assistance Needed

Wanted: Dead Savanna Monitor

We are looking for a carcass of an adult male Savanna monitor (*Varanus exanthematicus*) for a research project. Monitor must be recently deceased (within a 24-hour period). Please call Diane Callaway at Omaha's Henry Doorly Zoo (402) 733-8401 if one becomes available.



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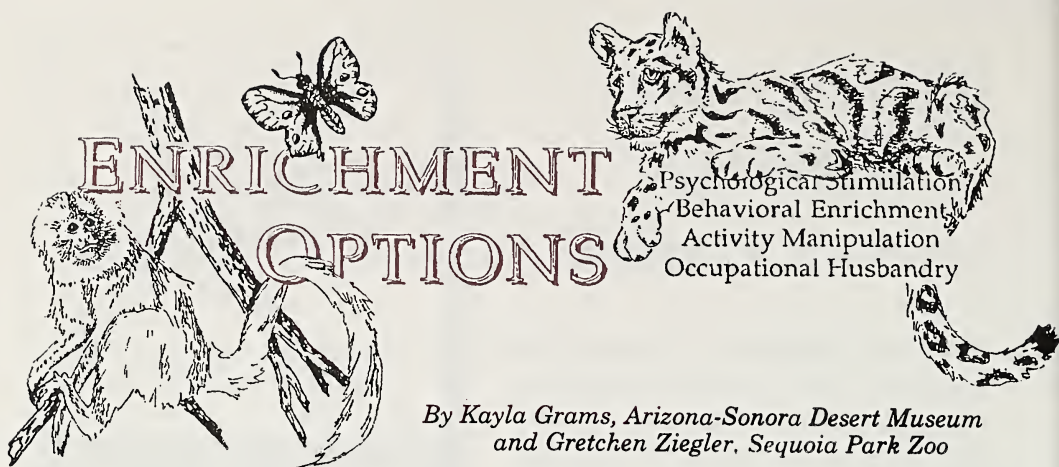
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PRIMATES:

Forage Hammock - At the Philadelphia Zoo, we are always trying new ways of keeping our primates active throughout the day. I tried the hammock with our tamarins, marmosets and our guenons. In the hammock I put hay and food items, including mealworms, crickets and their normal diet. This kept them busy for quite some time and one of our male guenons even pulled everything out and sat and played in the hammock.

Supplies needed: Burlap, Cable Ties

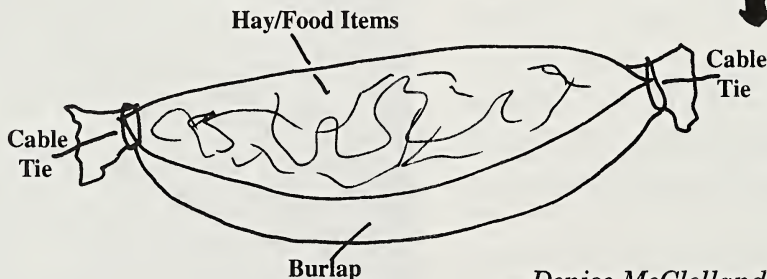
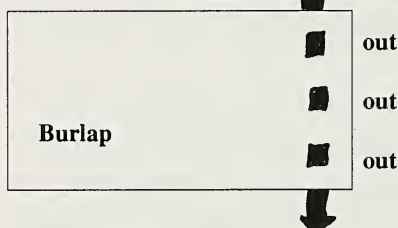
Assembly: Thread the cable tie through the end of the burlap, about one inch from the end. This is done at both ends, using your judgment according to the size of the hammock you need. Then pull and gather them in to close the ends and this makes a basket of the burlap.

Hanging: you can also use cable ties to hang; fill with hay and enjoy watching.

Just weave like this:



Cable Tie — in



—Denise McClelland, Keeper
Philadelphia Zoo, Philadelphia, PA

PARROTS: EVERYTHING MUST BE DESTROYED ! The "official" motto of every self-respecting parrot, is an idea that goes a long way in psittacine enrichment. Parrots, as we know, are very smart and quickly become bored with many toys. If, however, the toy can easily be chewed apart, they tend to stick with it until the job is done. The quicker a parrot can ruin one toy and move to another, the better. That may sound like a lot of extra work for the keeper, but not really. Remember parrots don't care how fancy the toy is, they just want to destroy it. Don't spend forever designing and building toys, give simple toys often, not complex toys infrequently.

Here are some quick ideas that have worked for me:

- cut scrap wood into pieces small enough for the bird to hold, then hand it to them. Twigs and branches work too. This one works a lot better than it sounds.
- paper cups, paper towel tubes, etc.
- attach a block of wood to a rope and hang it in the cage
- offer bamboo, branches with leaves
- empty cardboard boxes for that nestbox feel (most birds love this one)
- rocks, yes rocks. Several birds I care for love to chew on all sizes of rocks.
- if you will be with the bird for awhile, let it play with your key ring
- hand the bird an extra cage lock
- build a "play tree" out of scrap wood
- provide interesting perching, i.e. ropes, perches that move with the bird's weight, natural branches of many different diameters
- turn on a water sprinkler in a section of the enclosure
- last but not least, don't give the bird its entire diet in the morning. Creating a 'psychological hunger' makes the bird more alert, active and receptive to enrichment. Offer 20% of the bird's daily intake (not 20% of the prepared diet) in the morning and the 20% half way through the way, and the rest at the end of the day.

Most birds won't enjoy all of the above ideas, though most will eventually get used to a lot of them. Don't give up! A block of wood may initially scare the bird, but after they are used to it, it can provide a hour of chewing pleasure.

*—Matt Edmonds, Animal Care Specialist
Disney's Discovery Island, Orlando, FL*

(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. Eds.)

AAZK Publications Available

AAZK Diet Notebook, Mammals, Vol. 1 - reference work containing 325 diets representing 213 species and subspecies from 14 participating institutions. Diets are arranged taxonomically using ISIS numbers. Comes in sturdy 3-ring D binder. Each Diet Response Form includes common name, scientific name, ISIS number, contributing individual and their institution, how long the diet has been used, whether the animals have bred on this diet, the diet ingredients, preparation instructions, notes and remarks on special considerations, and nutritional analysis (when available). The publication is in its second printing and is copyrighted by AAZK, Inc. Cost is \$40.00 for AAZK members; \$55.00 for Nonmembers; \$70.00 for Institutions. Prices are for prepaid orders and include U.S. and Canadian shipping. Overseas orders should add \$20.00 for parcel post surface shipping.

Zoonotic Diseases, 2nd Edition - 40-page reference work details the most common zoonotic diseases, offers guidelines for preventive control and covers personal hygiene and disinfection procedures. Information for each disease is presented in a text format and includes etiologic agent, means of transmission to man, global distribution, alternate or intermediate hosts, human incubation and human symptoms. Cost is \$8.00 for AAZK members; \$12.00 for Nonmembers. Price includes domestic shipping; orders outside U.S. and Canada should add \$3.00 per copy for air mail.

HALF PRICE - Zoo and Aquarium Professionals: The History of AAZK - 216-page volume chronicles the history of the American Association of Zoo Keepers, Inc. from its beginnings at the San Diego Zoo in 1967. Includes early evolution of the Association, its projects, programs and committees, the histories of its 70-plus Chapters and its involvement in the highly successful conservation program "Bowling for Rhinos". Cost is \$5.00 for AAZK Members; \$7.50 Nonmembers. Orders outside U.S. should add \$3.00 per copy for postage.

"What Kind of Animal Are You" - 40-page collection of zoo keepers' favorite anecdotes about their work, the animals, and the visitors. Produced by the Brookfield Zoo Chapter and edited by John Stoddard. LIMITED NUMBER AVAILABLE. Cost is \$5.00 for AAZK members; \$8.00 for Nonmembers. Non-domestic orders add \$3 for shipping.

To order any of the above, send your name, complete mailing address, phone number, number of each item you wish to order and a check or money order (U.S. Funds only) made payable to AAZK, Inc. Send to: AAZK Publications, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Mastercard or Visa orders accepted by telephone only - call 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada).

Legislative Update

*Compiled by Georgann Johnston
Legislative Advisor
Sacramento, CA*



USFWS Solicits Input for CITES Appendix Listings

The tenth meeting of the Conference of the Parties to CITES will be held in Zimbabwe from June 9-20, 1996. In preparation for that meeting, the U.S. Fish and Wildlife Service is requesting information that will help the Service identify species that are candidates for addition, removal, or reclassification in the CITES appendices. The Service is also looking to identify issues warranting attention by the CITES Nomenclature Committee. The request is not limited to species found only in the United States, although U.S. proposals submitted to recent conferences have usually focused on species native to this country.

The method for submitting information is outlined in great detail in the USFWS's document "Request for Species Amendments and Resolutions for Consideration at the Tenth Regular Meeting of the Conference of the Parties to the CITES". The Service will consider information and comments received until the 30 April 1996 cutoff. A copy of the complete format for proposals can be found in the Federal Register, 1 March 1996, volume 61, number 42. Further information can also be obtained from Dr. Marshall A. Howe, Office of Scientific Authority, USFWS, 4401 North Fairfax Dr., Arlington, Virginia 22203 (703) 358-1708.

Source: Federal Register, 1 March 1996, volume 61, number 42

Japan Continues Aid to Malaysian Environmental Project

The Japanese government has agreed to continue to provide funding to the International Tropical Timber Organization (ITTO), a multilateral association which oversees a variety of environmental projects in Malaysia. The ITTO also receives funding from Denmark, Switzerland, Norway, the U.K. and the U.S. Japan, though, continues to be the organization's largest contributor, providing 89% of the entire ITTO budget between 1987 and 1995.

In the past eight years, Japan's contribution of over \$9 million dollars has funded 24 projects. These include a sustainable forest management and development program in Peninsular Malaysia, the development of an operational model for sustainable management of natural tropical forests, and the organization of an international workshop on improved utilization of timber resources in all of Southeast Asia. Of particular interest to zoo keepers was the funding used to develop a 200,000 hectare (770 sq. mi.) Lanjak-Entimau Wildlife Sanctuary in Sarawak,

Malaysia. Animal species which will benefit from the projects include the chevrotain, the loris, siamangs (gibbons), crocodiles, and flying foxes.

Source: Business Times of Malaysia, 17 January 1996

Doonesbury Comic Strip Has Impact on Efforts to Dismantle ESA

An attorney with the Natural Resources Defense Council reports that the comic strip "Doonesbury" has had a significant impact on Republican efforts to dismantle the Endangered Species Act. The attorney, Bobby Kennedy, Jr., reported that a recent focus on the Republicans and the ESA in the daily comic strip has brought public attention to the issue where other methods of garnering interest have failed. Kennedy reports that his uncle, Senator Edward Kennedy (D-MA) "called him from the Senate cloakroom to explain how the cartoons were being passed around and how the senators were reluctant to vote for certain pieces of legislation because they didn't want to show up in Doonesbury."

When asked for his opinion on the subject, Representative Newt Gingrich (R-GA), who is depicted in Doonesbury as a bomb with a lit fuse, says the strip's "impact is not decisive."

Source: Sierra Club Online Action Alert #175, 1 March 1996

Amargosa Toad Denied Endangered Species Listing

The U.S. Fish and Wildlife Service has announced a 12-month finding on a petition to list the Amargosa toad (*Bufo nelsoni*) as an endangered species. The USFWS has determined, after reviewing all of the available scientific and commercial information concerning the status of the species, that the listing of the toad is not warranted. Since 1982, the toad has been identified as either a category 1 or category 2 species under the ESA.

Found only in tributary springs of the Amargosa River of Nevada, the toad's status has been imperiled by livestock grazing, water diversion, flood control activities, off-road vehicle use, and the introduction of non-native species. The initial petition requesting endangered listing stated that the population of the species had declined from thousands in the late 1950's to only 30 individuals in 1994. The USFWS based its decision to decline listing of the species, in part, on conflicting information found by various researchers coupled with evidence of voluntary conservation efforts by landowners in the area of the Amargosa River. Instead of listing the species, the USFWS decided to continue monitoring the toad's population trends and measuring the effectiveness of the voluntary conservation measures.

Further information concerning the decision may be obtained from State Supervisor, USFWS, Nevada State Office, 4600 Kietzke Lane, Building C-125, Reno, Nevada 89502, (702) 784-5227.

Source: Federal Register, 1 March 1996, vol. 61, number 42.

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*Late Fee charged after 9-1-96 Total Amount Due: \$ _____

Fee does not include cost of Conference Proceedings. Fee included \$20.00 contribution to AAZK National. Make checks payable (U. S. Funds) to: Detroit Chapter of AAZK. Return form and all fees to: Pat Granberry & Beth Johnson, Detroit Chapter of AAZK, 8450 West 10 Mile Road, Royal Oak, MI 48068-0039.

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The tools we use as zoo keepers may range from the primitive, like shovels, to the high tech, like night vision glasses. The animals also use tools to manipulate their environment or to receive water or food (we call this enrichment). Please come share your knowledge and experiences about this or other topics such as conservation or husbandry.

Those interested in presenting a paper or poster presentation, or proposing topics for workshops and roundtable discussions please submit a short abstract. Abstracts need only to be one to two paragraphs in length. They should include the main thrust of your topic, results and conclusions. At this time we request you also send the following information; the presenters name and title, institution affiliation, the title of the paper, poster or workshop and any equipment that maybe needed (kindly be specific). **Please submit abstract by 1 July 96.** Presenters will be contacted no later than 1 Aug 96. You will also receive guidelines for presentations from the AAZK. A copy of your presentation for the proceedings will have to be in by Monday 7 Oct. 96.

Presenters will be allowed 20 minutes which should include time for questions. Workshops and roundtable discussions will be given individual consideration for time that is needed.

Send abstracts, program questions and suggestions to :

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AAZK Announces New Professional & Contributing Members

Christine K. Ross, retired from **Creative Creature Productions (MA)**; Shanna Abeles and David R. Caron, **Franklin Park Zoo (MA)**; Jonathan Shine, **Roger Williams Park Zoo (RI)**; David F. Orndorff, **Beardsley Zoo (CT)**; Douglas Rosenblum, **Downstate Medical Center (NY)**; Marian Duffy-Sykes and Scott Bartlow, **Philadelphia Zoo (PA)**; Jennifer Kim, **Buttonwood Park Zoo (PA)**; Christine Mallar and Kerri Myers, **Zoo Atlanta (GA)**; Brandi Schneider, **Santa Fe Teaching Zoo (FL)**; Christy V. Conk, **Brevard Zoo (FL)**; Juan Escobar, Jr., **Miami Metro Zoo (FL)**; Stephanie Johnson, **Lowry Park Zoo (FL)**; Elizabeth B. Haas, Kim Avis, Denise D'Angelo, Tracy Dunlap, Robert E. McGuire and Sabrina Smith, **Memphis Zoo (TN)**; Theresa M. Rhyner, **Cleveland Metroparks Zoo (OH)**; Melissa Bishop, **Saginaw Children's Zoo (MI)**; Daniel Brauneis, **Niabi Zoo (IL)**; Sarah McDowell, **Dickerson Park Zoo (MO)**; Denise Neufeld, **Sunset Zoological Park (KS)**; David B. Alexander, **Little Rock Zoo (AR)**; Judson Phillips, **Caldwell Zoo (TX)**; John D. Kelly, Jr., **Cameron Park Zoo (TX)**; Tommy Carlson, Roger Gutierrez, and J.D. Coffey, **San Antonio Zoo (TX)**; Robert M. Hicks, **Pueblo Zoo (CO)**; Melinda Morgan, private collector, **Scottsdale, AZ**; Shelly Lindsay, **Rio Grande Zoo (NM)**; Jaimie L. Rountree, **Six Flags Magic Mtn. (CA)**; Tammy Batson, Jennifer J. Sanders, and Ken Petrochko, **San Diego Zoo (CA)**; Greg Gilbert, **Oakland Zoo (CA)**; Scott Bentall and Gena Bentall, **Wildlife Safari (OR)**; Shanon M. Smith, **Point Defiance Zoo & Aquarium (WA)**; Sarita Pointek, **Cat Tales (WA)**; Jacqueline Craig, **Metro Toronto Zoo (Ontario)**; and Wade Kresnow, **Valley Zoo (Alberta)**.

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ABC's



Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero
Independent Behavior Consultant
Ark Animals of California, San Diego, CA

This Month: Lingo Limbo

QUESTION:

Our facility recently went through a training class and I am at a complete loss as to what all the terminology means. I am also frustrated with trying to use some of the techniques. I can get so far but then am stuck in some situations. Can you shed some light on this topic for me?

ANSWER:

Don't worry, you are not alone! Terminology is not that important if you can understand how to apply those techniques. Skill development takes a bit of time and experience. Also, learning to properly "read" an animal is natural to some and an acquired skill to others.

Here are some training tidbits:

1. Everything is either reinforcing or reprimanding.
2. Learning is accomplished faster in short focused and frequent sessions ending with success.
3. You will retain about 10% of what you were taught in class.
4. Be patient with yourself and the animals, you all are beginners.
5. New skills take 30 days to establish. That means practicing daily!

Common mistakes new trainers make:

Repeat command too much
Do not give animal enough time to respond
Timing is off on bridging and reinforcement
No release word or consistent bridging criteria to terminate behavior
Trying the behavior just one more time in the session

PRACTICAL DEFINITIONS:

Chaining:

Where the animal links behaviors together. Usually a training error where the trainer does the behaviors in a specific order each time and the animal links them together as one. You ask for one and get a series.

Successive Approximation:

Working toward a goal! This is a term used for the steps when trying to get a final behavior. When you first ask for a behavior you are not very picky. Reward a correct response. Later, as you get better, you get more demanding. Reward the quickest response, the straightest response. Also you approximate, or work gradually up to your proper training position and signal. This could be a physical signal or removal of an object like a target.

Distraction:

Things that take away attention from you, the trainer. This can also affect the animal if it is moved into a new situation. A behavior trained in the den area may be difficult to get in the yard area initially.

Desensitization:

When the animal pays attention in the yard area and responds. Also what happens when you repeat the command too much! (The animal does not respond as quickly as it used to.) Most often used in husbandry work or show performances. Teaching the animal to ignore something.

Intermittent reinforcement:

What you should be using! Rewarding unpredictably. You get a better response if you do not use food rewards all the time. This can apply to time intervals or quantity or reward. Usually best when rewarding several things at once such as a fast, sharp, high degree of response versus a fast response.

Conditioned Reinforcer:

Something that becomes reinforcing. This could be the bridge or even the presence of the trainer. It is usually first paired with the **primary reinforcer** (food).

Aversive:

Something the animal wants to avoid. Could be a trainer yelling and screaming with the vein popping out of the neck.

Window of Opportunity:

The time an animal has to earn a reward. The time a trainer has to reward a behavior. Timing is often critical; if you are off, - you could be reinforcing something else.

Next month: Terrible Tiger

(About the Author: Since 1978 Diana has been active both in the U.S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training.)

Management of Captive Black-tailed Prairie Dogs

(Cynomys ludovicianus)

Utilizing Natural Patterns of Dispersal

By Taylor Edwards

Keeper- Mammalogy and Ornithology

Arizona-Sonora Desert Museum, Tucson AZ

Abstract

An above-ground tunnel was constructed to connect the two separate black-tailed prairie dog (*Cynomys ludovicianus*) exhibits in the desert grassland habitat at the Arizona-Sonora Desert Museum. In the wild, prairie dogs maintain the optimum size of their colonies through emigration and immigration. By allowing free movement between the two exhibits, it was anticipated that the prairie dogs would establish an optimal carrying capacity for each. This management tool became an exciting enrichment device, provided valuable interpretation of ecological theory to the public, and gave an insightful look into the complexity of prairie dog social behavior and population dynamics.

Introduction

Historically, prairie dog towns covered much of the plains and grasslands of North America. In the last century prairie dog populations have been dramatically reduced due to habitat loss and control efforts. The most abundant and widely distributed species of prairie dog is the black-tailed, which lives in densely populated "towns". Towns are subdivided into smaller groupings called "coteries", consisting of a dominant male, breeding age females, and sexually immature young. Coteries form the main social structure of a prairie dog's life. Females typically spend their entire lives in the same coterie, but when males reach sexual maturity at approximately two years of age they emigrate to establish their own coteries. Dispersal of young males is an important part of prairie dog biology in that it helps prevent inbreeding and maintains the social order of the coterie.

The desert grasslands habitat at the Arizona-Sonora Desert Museum contains two separate black-tailed prairie dog exhibits; a large exhibit 216m square (2320 ft. square) with a moat back and 70cm (28") glass front, and a smaller exhibit 48m square (520 ft. square) placed adjacent to a ramada with a moat back and shark wire front. The habitat immerses the visitor in the grasslands experience by "sinking" the paths between rolling, grassy hills which, from the visitors' perspective, seem to continue beyond their viewpoint. the smaller exhibit allows the visitor to get up close to the prairie dogs; burrow structure and burrow commensalism are interpreted. The large exhibit adds to the naturalism of the

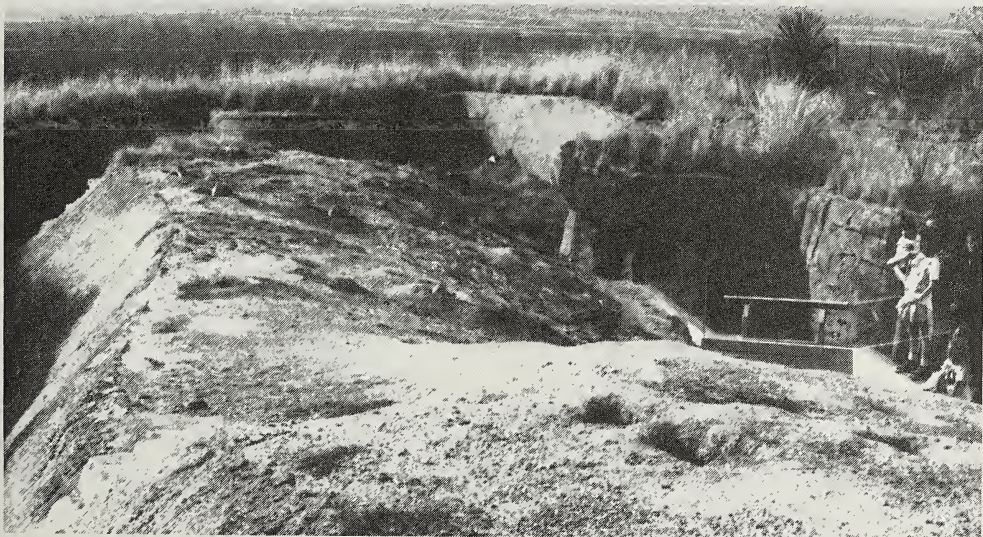
grasslands habitat by recreating the continuity of a wild prairie dog town. Social behavior is interpreted at the large exhibit.

The prairie dogs were moved to this habitat in the winter of 1992 from a single, older exhibit. four prairie dogs were released in the large exhibit and a pair was placed in the smaller one. After two years of successful breeding in the small exhibit there were fourteen prairie dogs. The prairie dogs in the large exhibit were unsuccessful in raising young, so there still remained only four. Attempts to relocate individuals from the small exhibit to the large exhibit by use of live traps failed. The prairie dogs in the small exhibit ignored the traps for weeks even when rations were reduced and placed only in the traps.

To better balance the number of prairie dogs between the two exhibits, an above-ground tunnel was constructed to allow the prairie dogs to disperse freely from one exhibit to the other. It was assumed that the prairie dogs in the smaller exhibit, which was overcrowded and barren of grass, would naturally prefer to establish themselves in the larger exhibit, which contained lush vegetation and more space. The tunnel would allow the prairie dogs to reach an optimal carrying capacity for each exhibit. This was known as "The grass is always greener on the other side" theory and the tunnel was nicknamed the "habitrail" after those pet store hamster cages with the yellow, plastic interconnecting tubes.

Methods

The habitrail was constructed of 2.5x1.25cm (1" x0.5") galvanized steel wire mesh. Pieces 1.22x1.02m (48" x40") were folded and fastened with aviary clips to create a tube with a square opening 25.4x25.4cm (10" x10"). Segments were connected with aviary clips to form a 21.6m (71') tunnel consisting of one 90° and one 135° bend (see diagram 1). The habitrail was laid on top of the ground and held in place with 61cm (2') rebar stakes hammered partially into the ground and tied to the sides with wire.



ASDM Desert Grasslands Habitat - large black-tailed prairie dog exhibit showing moat and visitor viewing area. (Photo: Taylor Edwards)

Entrances to the tunnel began at the top of the outside wall of the moat and were surrounded by a sheet metal disk with radius 61cm (2') and coned 30° toward the exhibit (see diagram 2). A 15cm (6") wide wood ramp approximately 1.2m (4') rose from the inside moat wall, across the moat, to the tunnel entrance. The cones were used to prevent escape either by climbing on top of the habitrail or by jumping from the ramp to the outside wall of the moat. The ramp was inclined and narrow to prevent prairie dogs from spending much time on it and to prevent escaping. Once on the ramp and at the entrance to the tunnel, the emigrating prairie dog could not see beyond the sides of the cone, so it was faced with only two choices: either enter the tunnel or retreat back to the exhibit. Two 'combs' consisting of a wood handle and 8-10 metal rods were made and kept at each entrance in case the trail had to be shut down quickly.

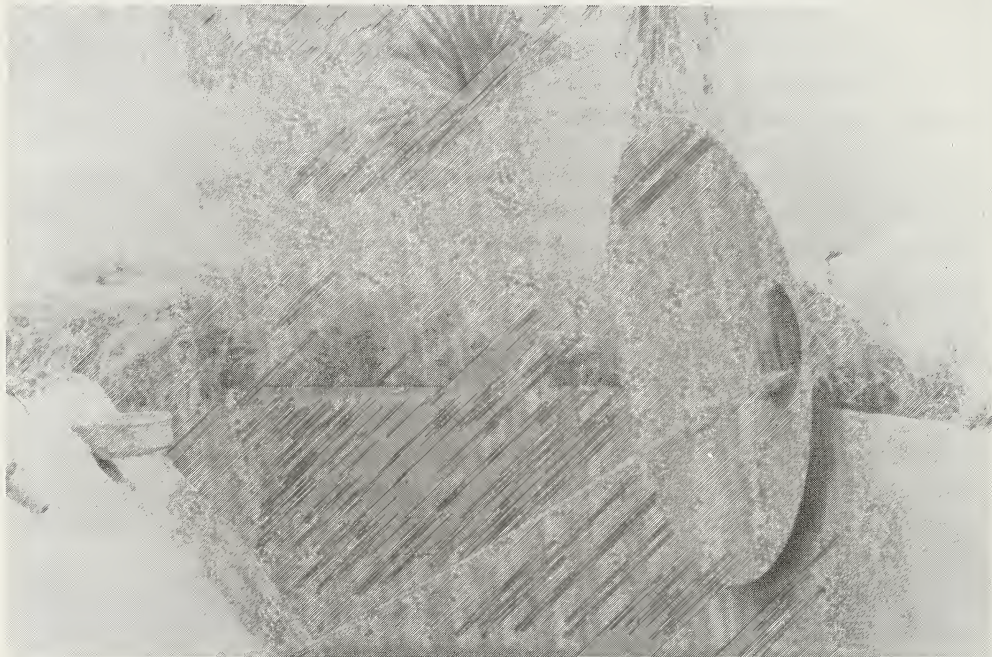


DIAGRAM 2 - Cones placed at entrance to habitrail prevent prairie dogs from escaping. (*Photo: Taylor Edwards*)

To make the prairie dogs feel less vulnerable once in the tunnel, 2.5m (8') sections of burlap covered the habitrail every 2.5m (8'). This created temporary shelter for the prairie dogs during an emigration.

The habitrail was set behind the exhibits and concealed by tall grasses to hide it from public view. The cones were painted a flat earth-tone to diminish their visual impact on visitors. Since this was an experiment, aesthetics were not a concern. There are plans to reconstruct the trail in the future and incorporate it as a permanent part of the exhibit. The new design will conceal the entrance from public view.

GRASSLANDS HABITAT AT THE ARIZONA-SONORA DESERT MUSEUM;
LARGE AND SMALL PRAIRIE DOG EXHIBITS CONNECTED BY HABITRAIL

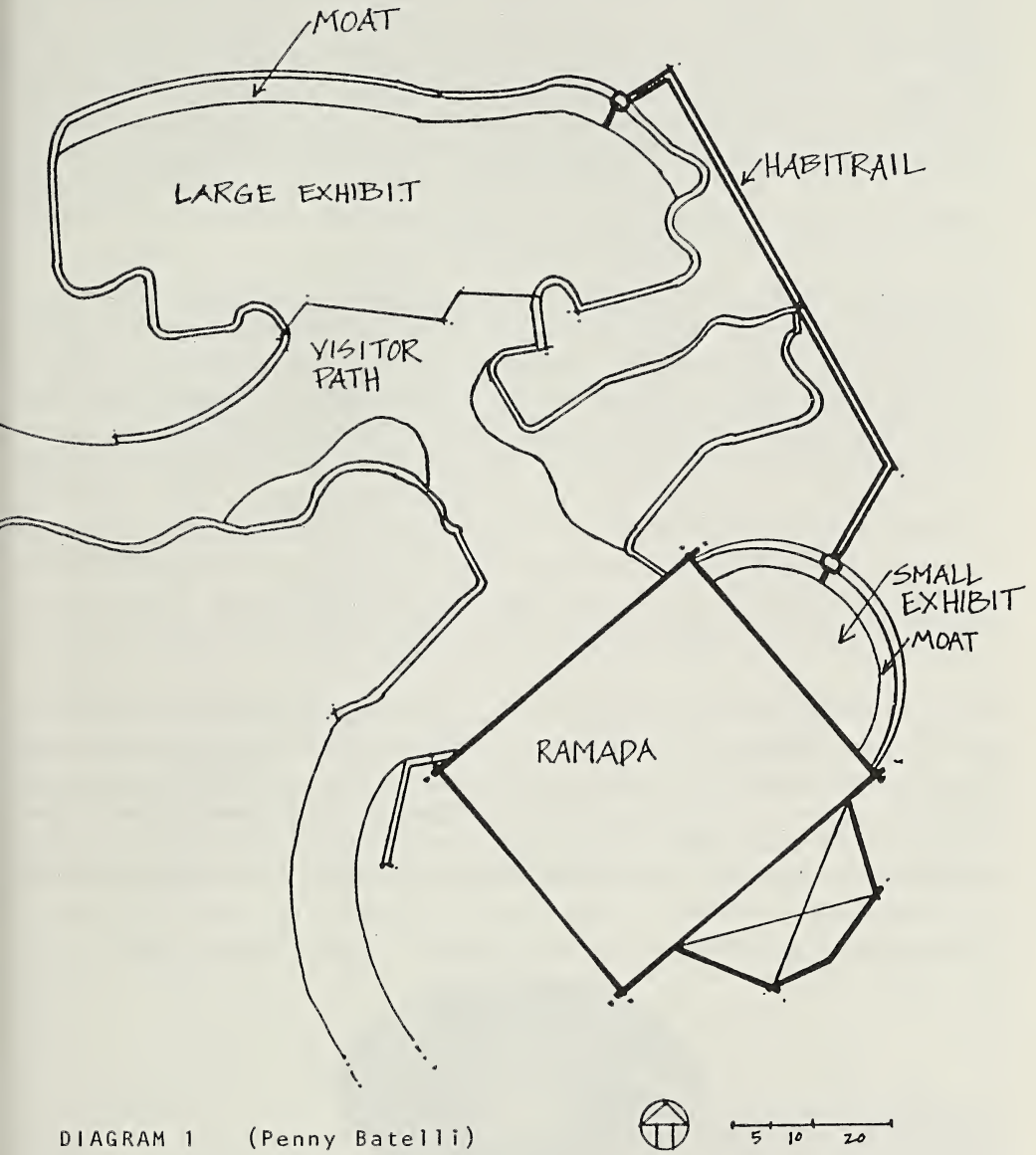


DIAGRAM 1 (Penny Batelli)

Results

On 6 July, 1994 the large, obtrusive cones were put into place for the prairie dogs to get accustomed to their presence. The habitrail was completed and opened on the morning of 12 July. To encourage its use, the habitrail was continually baited throughout the experiment. Because of their avoidance of live traps, a long period of acclimation was anticipated before the prairie dogs would feel comfortable enough to enter the habitrail. However, by late afternoon of the first day the prairie dogs in the small exhibit had already begun to venture into the tunnel. The first immigration occurred on 13 July. A fifth prairie dog appeared in the large exhibit and seemed very out of place in the foreign environment, not utilizing burrows for shelter.

The period of 13 July to 25 August consisted of much activity. There was virtually continuous territorial vocalization throughout the day between both exhibits as prairie dogs were staying alert of the changing population dynamics. Fighting was frequently seen in the large exhibit along a mid-line; it appears that the original inhabitants occupied the west half of the exhibit, while the new recruits were moving into the east side at the habitrail entrance. The east side had lots of fresh digging as immigrants were attempting to settle in. The maximum number of prairie dogs seen in the large exhibit at this time was nine on 18 July. It is assumed that this consisted of the four original inhabitants and five immigrants; however, we were not able to identify individuals. There was no evidence that prairie dogs originally from the large exhibit ever ventured to the small one.

From 30 July to 25 August, settlement appeared to stop in the large exhibit, and the population rose back to fourteen in the small exhibit. The prairie dogs from the small exhibit were still using the habitrail to cross into the large exhibit to forage, but were returning to their original coterie to live. Rations were reduced in the small exhibit to encourage emigration, but the regular feeding schedule was quickly resumed due to intense aggression in the large exhibit by

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its inhabitants toward the foraging intruders. A wild rattlesnake found in the the small exhibit on 28 August also did nothing further to encourage emigration.

On 2 September, the habitrail entrance platform at the large exhibit was found covered in blood. A prairie dog was later seen in the small exhibit with a large gash on its head (it recovered completely). This was probably a result of fighting on the large exhibit. No more than four prairie dogs have since been seen in the large exhibit and it appears that all immigration and temporary foraging has stopped.

The habitrail remained functional until spring of 1995. The only other observation of its use was 19 March, 1995 when two shabby looking prairie dogs were seen in the small exhibit side of the tunnel. Males in the small exhibit were observed with enlarged testes and battle scars as is common with spring reproductive activity. These habitrail users were likely young males (1-2 years old) preparing to establish their own coterie elsewhere. The habitrail was finally taken down 24 March, 1995 to accommodate a construction project in its vicinity.

Discussion

Although the habitrail did not accomplish what it was originally intended to achieve- redistributing our prairie dog population between two separate exhibits- it did prove to be a very educational and productive experiment. It gave insight into the complexity of population dynamics of social animals. In a captive situation it is easy to manipulate a population to our definition of the best carrying capacity, but from the animals' perspective there are other factors of which we are not aware. The habitrail allowed the animals to make their own choices. What we would describe as a poor quality environment (barren landscape, overcrowded) in the small exhibit obviously had benefits to the prairie dogs or were costs outweighed by other benefits. I assume that the protection provided by an individual's family group/coterie is more highly valued than space. It may also be a wiser choice for prairie dogs to accept poor conditions than risk the threat of injury from fighting over resources or territory, particularly when food reserves are not limited, as is the case in a captive situation. I predict that had the habitrail been left up through the summer of 1995, young males from the small exhibit would have completed an emigration and successfully established their own territory in the large exhibit. It is the natural tendency of males to leave their original coterie at two years of age.

Observation of the amount of tension caused by the immigration of individuals to a new territory in this experiment lends itself to understanding better the stress involved in transferring social animals among captive populations or even relocating them in wild populations. Although problems rarely occur in managing captive prairie dogs, changes in social dynamics should always be a concern when a new individual is introduced to a population. After witnessing the tension caused by this experiment, I am less likely to believe that the relocation of wild prairie dogs (nuisance animals/animals from development

areas) can always be successful. Especially since many wild areas are merely pockets of land surrounded by boundaries of development resembling a captive situation, wild populations do not have as many options for dispersal. The factors which determine population densities are likely based on a complex balance of environmental conditions and social behavior.



Despite the stress and tension caused by the habitrail, it provided an excellent source of environmental enrichment for our captive population of prairie dogs. The basic premise of enrichment theory is to create choices for captive animals so that they have some control over their own lives. The habitrail excelled in this by providing a long term variable to the captive environment which closely mimics the opportunities available to wild

populations. The fact that the prairie dogs in the small exhibit choose to stay in the barren, overcrowded environment, even if it was perhaps the lesser of two evils, added an entirely new dynamic to their lives. Such is often the case in the natural environment; choices are made by avoiding stressful conditions.

Finally, the habitrail provided an exciting interpretive opportunity for the visiting public. Temporary signs were put up that used words like, "Immigration", "Emigration", "Population", and "Carrying Capacity". It is part of the Arizona-Sonora Desert Museum's mission to increase ecological consciousness and these are extremely important concepts to convey. Such messages can easily be expanded to include all elements of an ecosystem. Humans, as well as plants and prairie dogs, have a carry capacity. This is a basic part of ecological principles which it is increasingly important for the public to grasp.

Whenever the habitrail is reestablished, it should continue to provide insight into the complex social life of the black-tailed prairie dog.

(Above Photo by Taylor Edwards)

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Acknowledgments

Special thanks to Bill Altimari, Carol Cochran, Karen Krebbs, and Peter Siminski for helping review and edit, and to the ASDM maintenance department for taking a few doodles and turning it into the habitrail.

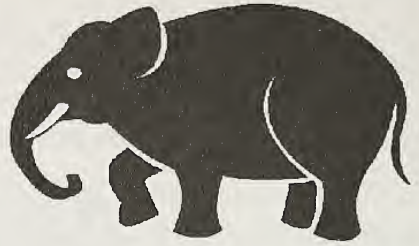
Information Please

Has anyone had any experience with mammals becoming what appears to be intoxicated due to perhaps eating fruit, i.e. apples, that are overripe? Is this more likely to occur during winter when animals such as black bear or beaver have a lower metabolism rate? Any information would be appreciated. Thank you. Please send to Jennifer A. Verstraete, Head Keeper Mammals and Amphibians/Reptiles, Trailside Museum/Zoo, Bear Mountain State Park, Bear Mountain, NY 10911-0427.

We are looking for information about Keeper exchange programs. We are interested in starting an exchange program and have many questions, but few answers. If your zoo has a program, any available information would be appreciated. Please send information to: Maureen Meslovich, Cleveland Metroparks Zoo, 3900 Brookside Park Drive, Cleveland, Ohio 44109, call (216) 351-2489 or FAX (216) 661-3312.

I am assembling a field guide on N. American raptors, and would like to request information on all 53 native species. By "native" I mean species that have regularly bred north of the U.S./Mexican border for at least ten years. Anyone and everyone is invited to provide information and/or photos. Info that is especially needed is nesting (how many eggs and what color; nesting materials), hunting behaviors, favorite prey, unusual plumages, etc. Photos should show the entire bird, preferably as close as possible. Birds may be perched or in flight; wild, captive (for falconry), or in rehabilitation for release. Please keep in mind that although I cannot afford to pay for the use of info or photos, I will give credit for anything I use (for info - name in acknowledgements; for photos - name and city/state with photo in text). Please send all materials to Tito Jimenez, 13400 S.W. 78th St., Miami, FL 33183-3304.

Chapter News Notes



Greater Baltimore Chapter/AAZK

In December we had our elections and following are the new officers:

President.....Tony Barthel
Vice President.....Joann Shaffer
Secretary.....Megan Dudek
Treasurer.....Cheryl Ladota
Bowling for Rhinos.....Brad Hange
Chapter Liaison.....Rick Jones

Highlights for the Chapter from last year included our first Bowling for Rhinos for which we raised over \$2000.00. We also donated money to help protect the Javan rhino and increased our Chapter's membership.

—Rick Jones, Chapter Liaison

Topeka AAZK Chapter

The year has gotten off to a fast start here. We have managed to complete a zoo improvement project, had new officers take office, coordinated our education programs, and we are starting to organize the Bowling for Rhinos event. There will be a later article with design details on the zoo's new giraffe stocks, but their successful construction was a notable achievement for the Topeka Chapter. A generous donation from the Chapter allowed the stocks to be constructed out of metal instead of wood and to feature a rotating side as designed by the zoo's veterinarian, Dr. Ray Ball.

Our new officers took office at the January meeting. Two new non-officer

positions were filled this year in addition to last year's posts. The position of Historian was revived and a Special Events coordinator slot was created. The 1996 officials of the Topeka Chapter are:

President.....Darrell Agee
Vice President.....Warren Waters
Secretary.....Luanne Webb
Treasurer.....Darrin Webb
Liaison.....Michael Davis
Education Coordinator.....Tammy Root
Historian.....Kathy Waters
Special Events
Coordinator.....Jennifer Agee

The Special Events Coordinator is already hard at work on Bowling for Rhinos which is tentatively scheduled for sometime in April or May. In the area of education, our coordinator recently attended a meeting in which the Chapter's six educational programs were officially outlined for the Friends of the Topeka Zoo (FOTZ). Hopefully this will clear all the remaining obstacles which we have been encountering and stimulate requests.

That's it for now. With any luck the rest of the year will continue to be as productive.

—Michael Davis, Chapter Liaison

Queens Wildlife Center AAZK

The members of the Queens Wildlife Center Chapter of Corona, NY are please to announce the adoption of a new Chapter logo. It was designed by Chapter Vice President Laura Schwartz and officially adopted in 1995 (see inset).



Metro Boston AAZK Chapter

Our newly elected officers for 1996 are:

President.....Bob Hayes
Vice President.....Shanna Abeles
Treasurer.....Colleen Dougherty
Secretary.....Ian Ives

Our Chapter Liaison, Tom Aversa, recently resigned and we are currently accepting letters of interest from Chapter members to fill this position. Tom has been an active member of AAZK for many years at both the local and national levels, and his service to our Chapter in this position will be a great loss.

In 1995, we supported two main conservation projects. Our annual Bowling for Rhinos event raised over \$1300.00 and a very fun silent auction netted almost \$1000.00 which we sent

to the Bali Mynah Species Survival Plan.

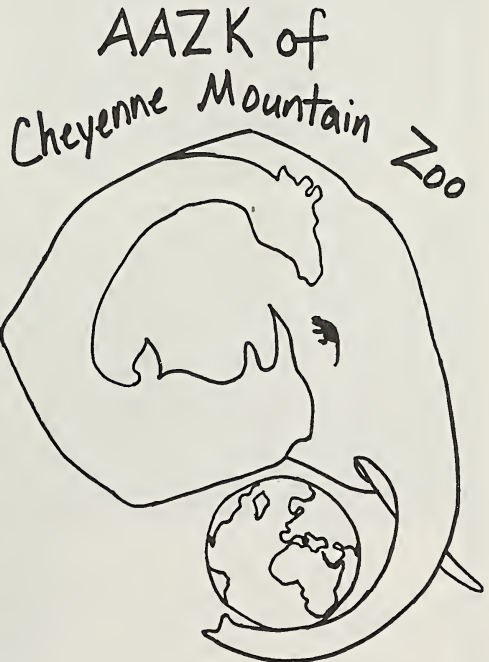
Through Chapter T-shirt sales, soda sales, and bottle redemptions we were able to support a variety of other projects such as the purchase of the ZIDP Notebook and an AAZK membership for our zoo library, and the Afrotropical Suid Poster Project.

Our main objectives for 1996 include increasing our membership, participating in more *in-situ* conservation efforts, and becoming more integrated with our zoo. Our office is located at the Franklin Park Zoo, Boston, MA.

--Bob Hayes, President

Cheyenne Mountain AAZK

Below is the new logo adopted by the Cheyenne Mountain Zoo AAZK Chapter (Colorado Springs, CO) in May of 1995. It was designed by Keeper Heidi Genter.



Historical Musth Period in an Asian Bull Elephant

*by Diana Guerrero, Ark Animals of California, San Diego, CA
Research conducted at San Diego Wild Animal Park*

The following is a collection of data on "Ranchipur" (#MO681243/SB#218), an Asian bull elephant (*Elephas maximus indicus*) currently housed at the San Diego Wild Animal Park in Escondido, CA. The data is an historic collection taken from the keeper logs regarding musth periods from 1982 through 1994.

Due to the variety of interpretations and descriptions of details over the years, staff changes, and individual interpretations, the start and finish of the musth period can only be estimated.

For future consistency and further studies, the behaviors and physical symptoms observed have been structured into an ethogram to allow detailed recording of the different phases. The following is the compilation of the records on file, delineation of the three phases, and the ethogram and symbols used in it that evolved from the analysis.

It is hoped that other institutions will utilize something similar in order to help with the prediction and management of musth. The average historical duration of "Ranchipur's" musth periods varies from 95 to 153 days.

1994.V.29	to	1994.IX.17	(132 days)
1993. VI.14	to	1993.IX.21	(100 days)
1992.VI.10	to	1992.IX.14	(97 days)
1991.VI.8	to	1991.IX.30	(115 days)
1990.V.19	to	1990. X. 6	(141 days)
1989.V.23	to	1989. X.17	(148 days)
1988.V.21	to	1988. X.13-20	(146 - 153 days)
1987.VI.3	to	1987.IX.20	(110 days)
1986. V.6	to	1986.VIII.29	(116 days)
1985.V.15	to	1985,VIII.17	(95 days)
1984.V.8	to	1984.VII.23	(108 days)
1983.V.13	to	1983.VIII.21	(101 days)
1982.V.15	to	1982.VIII.31	(109 days)

Evidence Present During the Three Periods of Musth

Pre-Musth

Aggressing at moving objects
Confusion, not responsive
Decrease in appetite
Decrease in activity, will remain in one spot
Disoriented
Pupil dilation
Pushing tusks against objects

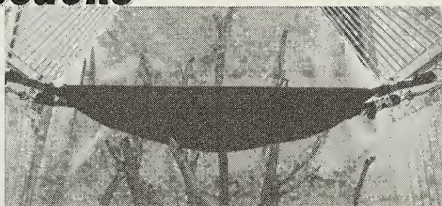
Musth

Temporal glands swell 1-2 weeks before
Aggressive behavior increases (Charges/tusking/head banging)
Decrease in activity, remains in one spot
Discharge from temporals (Pasty brown/beige to start)
Drainage of temporal fluids into mouth
Dribbling urine
Flapping ears on temporals
Not eating
Odor strong
Open/closing mouth, touching temporal glands with trunk
Sheath urine burn
Weight loss of about 1,000 pounds (due to not eating)

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Post Musth

Appetite increases
Dribbling urine stops
Penis unsheathed to urinate
Pupils return to normal
Temporals continue to drain

General Notations

There are unique needs that the bull elephant requires during his musth period. It is important that **shade** is provided to help protect the dilated eyes; **water intake** is critical due to the loss of weight and lack of food intake; **hosing** is mandatory to help prevent urine burn on the back legs and should be done twice a day, while a good hosing with warm water is advisable several times a week to help extinguish some of the odor of musth.

Other

Please note location and time observed. Any interest in cows or breeding attempts should be noted in detail. Any other specifics or noteworthy items may be included in the notation area.

Behaviors noted here are not specific to musth, but are useful to determine the onset and trends found around and during the musth period. Ranchipur is housed separately from conspecifics and keepers.



*artwork by Ric Urban
Houston Zoological Gardens*

KEY TO ETHOGRAM SYMBOLS

ACT

ACTIVITY LEVEL

ACTn	"normal
ACT+	"increase
ACT-	"decrease
ACTs	"stationary/no movement

AG

AGGRESSION

AGmo	"moving objects
AGso	"stationary objects
AGch	"charging
AGhb	"head banging
AGt	"tusking
AGkbf	"kicking back feet
AGff	"front feet
AGtr	"trunk
AGth	"throwing objects

B

BREEDING

Bi	"interest
Ba	"attempt
Bc	"copulation

C

CONFUSION OR DISORIENTED

D

DEFECATION

Dn	"normal
D-	"none

E

EAR

Ef	"flapping (constant on temporals)
----	-----------------------------------

FD

FOOD DRIVE

FDn	"normal
FD+	"increase
FD-	"decrease
FD0	"off food

M	MOUTH	
	My	"yawning
	Mb	"biting
O	ODOR	
	O+	"strong
	O-	"none
P	PUPIL	
	Pn	"normal
	Pd	"dilated
S	SENSITIVITY	
	Sn	"noise
	Sm	"movement
TG	TEMPORAL GLANDS	
	TGs	"swollen
	TGdp	"discharge, pasty
	TGdc	"length of discharge (to mouth)
	TGt	"touching (w/ trunk or rubbing)
TR	TRAINING	
	TR+	"responsive
	TR-	"not responsive
U	URINATION	
	Ud+	"constant dribbling
	Ud-	"inconsistent dribbling
	Un	"normal
	Ubs	"urine burn (discoloration) sheath
	Ubf	"urine burn (discoloration) feet/legs
	Ups	"penis sheathed
	Upus	"penis unsheathed
WT	WEIGHT	
	WT-	"loss
	WT+	"gain

LOCATIONS

UBY	=	Upper Bull Yard
LBY	=	Lower Bull Yard
INT	=	Introchute
BB	=	Bull Barn
G	=	Gate
P	=	Pool
DR	=	Drinker
T	=	Toy

OTHER

Please note location and time observed. Any interest in cows or breeding attempts should be noted in detail. Any other specifics or noteworthy items may be included in notation area.

Behaviors noted here are not specific to musth but are useful to determine the onset and trends found around and during the musth period. Ranchipur is housed separately from conspecifics and keepers.



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Ranchipur Musth Trend Behavior Log

WEEKLY LOG

YEAR: MONTH:

DAILY OBS. LOCATION AM/PM

		1	2	3	4	5	6	7
		MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
A	C	mo						
		so						
		ch						
		hb						
		t						
		bf						
		ff						
		tr						
		th						
	A	C	n					
	+							
	-							
	s							
B		i						
	a							
	c							
C								
E		f						
F	D	n						
	+							
	-							
	o							
O		+						
	-							
M		y						
	b							
P		n						
	d							
S		n						
	m							
T	G	s						
	dp							
	dc							
	i							
	t							
T	R	+						
	-							
U		d+						
		d-						
		n						
		bs						
		bf/l						
		ps						
		pus						
D		n						
		-						
Location Key:								
UBY= upper bull yard								
LBY= lower bull yard								
INT= introchute								
BB= bull barn								
G= gate								
P= pool								
DR= drinker								
T= toy								
Observer initials to go in AM/PM slot.								
See sample page.								

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks/AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.

CHILDREN'S ZOO DIRECTOR...BS in Biology/Zoology with experience preferred. Eight-acre facility with 23 animal exhibits. Three part-time zookeepers with 15 seasonal part-time employees. Responsible for animal care, zoo operation with special emphasis on educational programming and marketing. Must have creativity and a vision for the future. Salary commensurate with experience. Please send letter, resumé, and three references to: Saginaw Valley Zoological Society, Saginaw Children's Zoo, 1720 S. Washington, Saginaw, MI 48601; Phone (517) 759-1408. Open until position filled.

The following two (2) positions are available at Soco Gardens Zoo. Send resumé and references to: Soco Gardens Zoo, Attn: Jim Miller, Rt. 1, Box 355, Maggie Valley, NC 28751. Resumés taken until positions are filled.

ZOO KEEPERS...two immediate full-time openings. Seeking mature, responsible keepers who would enjoy working in a small zoo setting with a small keeper staff. Requires high school diploma, paid zoo and practical exhibit construction experience. Applicants must be able to work well with the public and staff. Willing to work most weekends and holidays. Duties include but not limited to animal and reptile care, exhibit maintenance and construction, and lecturing to the public. Salary \$15,000.00 - \$17,000.00, commensurate with experience, plus health insurance.

SEASONAL KEEPER/GUIDES...May - October, six days per week. Prior paid zoo experience preferred but volunteer experience acceptable. Applicants must be neat in appearance, have audible voice, work well with co-workers and public. Duties include but not limited to giving tours to the public, all aspects of animal care. Must be willing to work with non-venomous and venomous reptiles. Salary \$190.00 per week, plus uniforms, lodging and utilities.

ZOOKEEPER - Psittacines...requires minimum of one year paid, hands-on experience with Macaws and degree or equivalent zoo-related experience. **Mammals** - requires minimum of one year paid, hands-on experience with ungulates and felines and degree or equivalent zoo-related experience. Duties for both positions include daily care, feeding, habitat upkeep, breeding programs, record-keeping, medical coordination, training, acquisitions, supervising part-time staff/volunteers, and presenting educational programs, etc. Must be willing to work weekends/holidays. Starting salary \$15,000.00 - \$20,000.00 with year-end bonus and benefits. Excellent growth potential. Salary commensurate with experience. Send resumé/references to: Washington Zoological Park, 19525 SE 54th, Issaquah, WA 98027. Fax (206) 392-1076. Positions open until filled.

INTERNSHIP...the Miami Valley Serpentarium, a nonprofit organization, is seeking student interns for the 1996 fall season. MVS is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The intern will assist in the captive maintenance of the zoo's reptile collection, collect admissions in the exhibit, give interpretive talks and interact with the public, assist with educational outreach programs, and perform other duties as assigned. In addition the intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern **will not be involved** in the handling of any venomous reptiles. Desirable qualifications include a willingness to handle snakes and other reptiles on a daily basis, ability to communicate effectively with people, good writing skills, orientation to details, and self-motivation. Students majoring in the biological or natural sciences are preferred. Former interns have arranged for academic credit with their colleges or universities. Salary and benefits include experience with the most extensive and diverse collection of snakes in the area, housing, and \$55/week in pay. Personal transportation is recommended. Starting dates are flexible, but a minimum commitment of three months covering September-November is required. To apply send cover letter and resumé to: James R. Harrison, Executive Director, MVS Reptile Zoo, 1275 Natural Bridge Rd., Slade, KY 40376. **Deadline** for Fall applications is **15 June 1996**.

INTERNSHIPS...the Blank Park Zoo, Des Moines, IA, is offering animal management internships for the 1996 Zoo Season. Interns will be primarily involved in the operation of the domestic animal contact area and interaction with the public. They may also assist in other areas of the zoo as needed. This is an unpaid internship with a time commitment of approximately three (3) months, 30 hours per week. Applications will be taken until positions are filled. Please send letter/resumé to: Kevin Drees, Blank Park Zoo, 7401 S.W. 9th St., Des Moines, IA 50315 or FAX to (515) 285-1487.

SENIOR ZOOKEEPER/Herps and Fishes...requires a four-year degree in biology/related field and two years paid experience with a wide variety of amphibians/reptiles, preferably in a zoo setting. Research aptitude and experience plus. Responsible for front-line supervision required to facilitate the husbandry/management of diverse ectotherm collections. Will also have supervisory duties over the zoo's commissary department. Only individuals committed to public education, conservation, and animal health need apply. Starting salary \$21,192.00 to \$23,143.00 with excellent benefits. Send resumé **by 13 May 1996** to: Karen S. Graham, Curator of Herpetofauna and Fishes, Sedgewick County Zoo, 5555 Zoo Blvd., Wichita, KS 67212.

ZOOKEEPER/Mammals...responsible for observation, record maintenance, care of animals and cleaning of exhibits. Requires high school diploma with one year's working experience in a zoo mammal department. Degree in biology or related field desired. Previous elephant experience required. Starting salary \$19,884.00 per year with benefit package. For consideration submit resumé **by 30 April 1996** to: Nancy Foley, Director of Human Resources, The Toledo Zoo, P.O. Box 4010, Toledo, OH 43609-3100.

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City _____ State/Province _____ Zip _____

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an animal facility*

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Other staff & volunteers

- ☐ **\$30.00 Associate**
*Those not connected with
an animal facility*

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Title _____
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Signature _____

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ANIMAL KEEPERS' FORUM



The Journal of the American
Association of Zoo Keepers, Inc.

MAY 1996

ANIMAL KEEPERS' FORUM, 635 S.W. Gage Blvd., Topeka, KS 66606-2066

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AAZK PUBLICATIONS - CONTINUING DATA COLLECTION

Zoo Infant Development Project - Teri Maas-Anger/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Jennifer Hackshaw, Lowry Park Zoo and Suzanne Chacon, Costa Rica (Birds/passerines); Jeanne Stevens, Newark Museum

Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

Diet Notebook, Mammals, Vol. II - Susan Bunn Spencer, Rockford, MI

Incubation Notebook Project - Scott Tidmus, Sedgewick County Zoo, Wichita, KS

Exhibit Design Resource Notebook - Mike Demlong, The Phoenix Zoo, Phoenix, AZ



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About the Cover....

*This month's cover features the Wallaroo (*Macropus robustus*) drawn by Lee Houts of Sacramento, CA. In these sexually dimorphic marsupials from the kangaroo family, the male "Bucks" are dark chocolate brown; female "Flyers" are much smaller and light grey. Females are capable of sustaining three dependent lives simultaneously. An embryo in suspended growth (embryonic diapause), a "pouch bound" joey attached to a teat, and a joey, "at heel" primarily out of the pouch but still dependent on its mother's milk. During this time she produces two different types of milk to meet the nutritional needs of the different developmental stages of her joeys! Thanks, Lee!*

Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than 5.5" x 8.5"** (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm]) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

Deadline for each regular issue is the 10th of the preceding month.

**Dedicated issues may have separate deadline dates
and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by AAZK, Inc.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

Scoops & Scuttlebutt



New AAZK Historian Named

The AAZK Board of Directors is pleased to announce the appointment of Mark Levin as AAZK Historian. Mark is a Docent at the Philadelphia Zoo and is very active in the Philadelphia Zoo's AAZK Chapter. As Historian, Mark will be collecting archival data on AAZK's activities, which will include updating and maintaining historical records and documenting projects and products. All Chapters are urged to include their activities (projects, products, fundraisers, BFR events, etc.) in the archives. Items (or pictures of items) such as buttons, pins, T-shirts, posters, etc. may be sent to Mark or to AAZK Administrative Office. Mark may be reached at 3038 Arrowhead Lane, Norristown, PA; telephone (610) 825-8047; e-mail: fst zoo AOL. Make sure your Chapter is represented in AAZK's historical archives!

Chapters Show Support of AAZK Through Donations

The Board of Directors and the staff of AAZK, Inc. would like to thank two Chapters for their generous donations this month. The Cleveland Chapter donated \$500 which they specified will go for support of the Conservation/Preservation Grants Fund. The Caldwell Zoo Chapter, Tyler, TX, included a \$200 donation with their recharter fee for use at the discretion of the AAZK Board of Directors where it is needed most. Our sincere thanks for the generosity of these Chapters in supporting the Association and its programs.

Zoo Training Program Celebrates 10th Anniversary

The Niagara County Community College and the Buffalo Zoo are proud to announce the 10th anniversary of their cooperative Animal Management Program. Students who graduate this month will be the fifth class having a two-year Associate of Applied Science (A.S.D.S.) in Animal Management. During the two-year program at N.C.C.C., students intern at the Buffalo Zoo one day a week for five semesters. They have the opportunity to work in a wide variety of areas including reptiles, primates, gorillas, small mammal house, giraffe, hoofstock, Children's Zoo, cats, and birds. Information about the next class which begins in September of 1996 may be obtained by writing to: Carol Riniolo, Coordinator, Animal Management Program, Niagara County Community College, 3111 Saunders Settlement Road, Sanborn, NY 14132.

Cover Art Correction

Christina C. Smith, keeper at the Oakland Zoo, Oakland, CA has brought to our attention an error which appeared in the About the Cover write-up in the

March 1996 issue of *AKF*. This cover featured a drawing of a Grant's zebra with her foal drawn by Theresa Clark of Kansas City, MO. We stated that there were "three remaining species of zebra: Grevy's, Mountain, and Grant's." In actuality, the Grant's zebra is one of several subspecies of Plains zebras, which include Damaraland zebra, Selous's zebra and Burchell's zebra. The three remaining species of zebra should have been identified as Grevy's, Mountain, and Plains. Thanks to Christina for keeping us on our toes!

Volunteer Opportunities Available in U.S. National Parks

The National Park Service at Petrified National Park in northeastern Arizona is currently recruiting interested individuals to work on a number of projects. While this is a volunteer position, housing/full hook-up for RV/Trailer is provided. Studies and projects currently needing skilled and semi-skilled volunteer scientists to work with Park staff include: 1) Determining evolution of dinosaurs during the Triassic period; 2) Determining the paleoclimate and paleoecology of the Triassic period; 3) Breeding bird survey, inventory and monitoring, including an assessment and mapping of raptor nesting sites; 4) Large and small mammal survey, monitoring and inventory program, including a habitat assessment and analysis of the major mammals that inhabit the park (such as pronghorn, mule deer, coyote and bobcat); 5) A reptile and amphibian inventory and monitoring program; 6) A bat survey and roosting site assessment; 7) A prairie dog plague recovery assessment study; 8) Paleontological inventory and monitoring program; 9) Native American rock art documentation through photography; 10) Archaeological site monitoring program; and 11) exotic plant eradication and vegetation renovation projects. If you are interested in learning more or receiving an application package contact the Park at (520) 524-6228 Ext. 335.

Comment Portion of Survey Results in June AKF

The editorial staff of *AKF* will be presenting a synopsis of the comment portion of the *AKF* survey in the June issue. We appreciate all those members who took the time to offer comments and suggestions for improving the *Forum*.

BOWLING FOR RHINOS PIN

Available from the Portland Chapter

Show your support for **Bowling for Rhinos** with this 3/4 inch, five-color enamel pin. Cost is \$3.00 each or save on orders of 25 or more at a cost of \$2.00 each. Send requests for pins to:

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(503) 226-1561, Ext. 255; Fax (503) 226-0074



Message from the President

Greetings from the Lone Star State!

The Board of Directors of AAZK, Inc. gathered March 28-30 for their mid-year meeting at the AAZK Administrative Offices in Topeka, KS. It is my duty to report to the membership a brief synopsis of the meeting. Each Board Member is responsible for overseeing the activities of several committees or projects. Committee chairpersons or project coordinators officially report to their respective Board oversight twice a year. A detailed report of this meeting will be sent to Chapters soon.

Our organization has liaisons with several related organizations. Each liaison is a member of both organizations and reports the activities of each organization. Active liaisons are: The American Zoo and Aquarium Association (AZA), Canadian Association of Zoological Parks and Aquariums (CAZPA), and the Elephant Manager's Association (EMA). In the past couple of months, we have appointed liaisons with the Zoo Registrars Association and the International Marine Animal Trainers Association (IMATA). Liaison ties are currently being pursued with the Association of Zoological Horticulture (AZH) and the Association of Zoo and Aquarium Docents (AZAD).

The time is upon us for Bowling for Rhinos. Chapters are planning their local events to support our efforts to save all species of rhino. The members and supporters of AAZK should be very proud of their hard work and dedication. In 1995, 37 Chapters and institutions raised more than \$120,000 with BFR events. If you are interested in participating this year, please contact Patty Pearthree (317-322-8723) for more details.

Making a Realistic Contribution (Project M.A.R.C.), a division of the International Outreach Committee, is looking for Chapter support in transporting or helping to pay shipping costs for packages of library resource materials to foreign zoos. If you are willing to carry packages abroad as you travel or if a Chapter is willing to underwrite postage costs for this project, please contact Kathy Kelly (202-673-4869) for more details.

Liaison and Information Network for Keepers (L.I.N.K.), Mark de Denus, Coordinator, reported that the total number of AAZK Chapters is 74. The newest of the 74 is the Rio Grande Chapter at the Albuquerque Biological Park, Albuquerque, NM.

The Board is currently accepting nominations for the Certificates of Appreciation and Recognition. The former is given to an individual or institution outside of the Association for contributions made on behalf of AAZK, Inc. The latter is given to an individual or institution within AAZK, Inc. for contributions made on behalf of AAZK, Inc. These nominations are due to the Board President by the end of August. The Awards Committee is continuing to accept nominations

through 1 June 1996 for the award categories which have been advertised in the *Forum* (Jan.-April issues).

The Nominations and Elections Committee will begin advertising in July for nominations for the 1997 AAZK Board of Directors Elections.

Conferences - Start now and fill out the necessary paperwork to bid to host the 1999 AAZK National Conference! Contact AAZK Executive Director Ed Hansen (520-751-7812) with your inquiries and intentions to bid. Then come to Detroit and woo the delegation to vote for your city and institution to host the 1999 National. Conference Program Committees will now be provided with a Board Advisor. This appointed Board Member will assist the Conference Program Committee in organizing workshops that will be beneficial to the attending members.

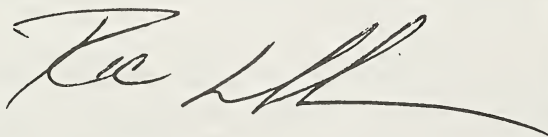
The 1996 Membership Drive is in full swing. Keep up the good work. While looking at our membership categories and the respective numbers, we discovered our institutional membership numbers are very low. Of 162 AZA accredited zoos and aquariums, 37 are members of our Association. The Board has recognized this and has pledged to invite all AZA institutions to join and support our organization. The Board also approved an increase in the price of an institutional membership to \$75 annually based on the calendar year.

Congratulations go out to a few members who have taken the challenge to play a more active role in the Association. The following individuals have been recently appointed to the named positions: Jeffrey Phillips, North Carolina Zoological Park, Bylaws Committee Chair; Mark Levin, Philadelphia, PA, AAZK Historian; and Jennifer Hackshaw, Lowry Park Zoo, Coordinator for the Passerine Section of the Bird Zoo Infant Development Project.

Finally, I would like to thank the members of the Kansas City Chapter of AAZK and the staff of the Kansas City Zoo for their wonderful hospitality. The Kansas City chapter invited the Board of Directors to visit while in Kansas for the weekend and showed us a fantastic facility. You were a great bunch. It was a pleasure meeting the recent transplants to Kansas City and seeing old friends.

The busy zoo season is here. Be safe. I want to see everyone in Detroit.

Sincerely,



Ric Urban, President, AAZK, Inc.
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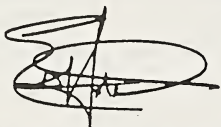
For approximately one year now, Susan Chan, Editor of *Animal Keepers' Forum*, and Board Member Dave Luce, Chair of Publications Funding have worked hard to bring advertising clientele to the *Forum*. The intent of advertisement is revenue generation. The current advertisements recoup approximately 35% of the cost to produce this monthly journal. Our goal is revenue generation equal to 50% of the production cost. We intend to do this while devoting only about 8% of the total available space to ads and the rest to informational text. The availability of information is why you are a member.

Revenue generation through advertisement takes the burden off the membership dollar. We have not raised individual U.S. membership rates in seven years and have only adjusted Canadian and International membership rates to reflect postal increases.

So where am I going with this? Take the time to support our advertisers and the products they sell. If you do not make the purchasing decisions in your facility, take the *AKF* to the person who does and share the information. Make some product inquiries to our vendors and offer suggestions for additional products. Many of our advertisers are looking for zoos that will test experimental products.

When our advertisers see a return on their dollar spent with AAZK, we will all benefit in the long run. From a quality publication, to quality products with keeper input, to reduced membership costs across the board.

Thanks.



Ed Hansen, AAZK Executive Director
Reid Park Zoo, Tucson, AZ

Coming Events.....

17th Biennial Pronghorn Antelope Workshop - June 5-7, 1996 at Kings Beach, CA. For information contact Laura Colton at (916) 653-6886 or Fax (916) 653-1019.

1996 Central Regional Volunteer Conference - August 2-3, 1996 at Sioux Falls, SD. Hosted by The Great Plains Zoo and Delbridge Museum. For information contact Jackie Goosen or Vanessa Lambert at (605) 367-7003 or fax (605) 367-8340.

ZOOMANIA - 96 - Southeast Regional Docent Conference - September 13-15, 1996 at Gulf Breeze, FL. Registration and hotel information available by contacting the Docent Council or Curator of Education at THE ZOO (904) 932-2229, ext. 27.

Association of Zoological Horticulture International Conference - October 4-12, 1996 in Greensboro, NC. For further information contact Corinne Benbow, North Carolina Zoological Park, 4401 Zoo Pkwy., Asheville, NC 27203.

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Conference Notes.....

1996 National Conference
October 6 - 10, 1996
Detroit, Michigan

When making your plans for Conference '96
don't forget to consider the following

Pre-Conference Trip, Saturday, October 5, 1996 - will include a Michigan loop to Binder Park Zoo in Battle Creek and John Ball Zoo in Grand Rapids. Experience their exciting, brand new exhibits.

Post-Conference Trip, Friday to Sunday, October 11-13, 1996 - an Ohio loop to the Sea World of Ohio. The season may be over but the action isn't over! What goes on when the crowd goes away? We'll also spend a day at the Cleveland Metroparks Zoo. A special attraction is their new Rainforest Exhibit. Last, we will tour The Wilds - a 9,000-acre animal conservation management, research and education center.

Theme for this year's Conference is **TOOLS OF THE TRADE**. Those interested in presenting a paper or poster presentation, or proposing topics for workshops and roundtable discussions need to submit a short abstract **by 1 July 1996**. When submitting an abstract please include the following information: presenter's name and title, institution affiliation, the title of the paper, poster or workshop, and any equipment that may be needed (please be specific).

Members are reminded that **Registration Forms** and **Hotel Forms** may be found in the April issue of Animal Keepers' Forum and will be published again in the June issue. Forms may also be obtained from Administrative Offices in Topeka, KS.



Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero

Independent Behavior Consultant, Ark Animals of California, San Diego, CA

BEHAVIOR EVALUATION: Tiger (*Panthera tigris altaica*)

Zoo, Lion House

QUESTION:

There is currently a young male Siberian Tiger (*Panthera tigris altaica*) that refuses to enter his cage inside the Lion House. What types of suggestions can be made to alleviate this problem?

BACKGROUND:

The young male Siberian is approximately four years of age and was transferred to the Zoo from another location. From the limited information available it appears that he was hand reared with his sister who is housed with him.

It has been tradition for over 40 years that in the early afternoon all cats housed in the Lion House exhibit areas are brought in for feeding and lock up. This lock up allows the keepers to perform the routine maintenance in the yards.

Before the lock up, the public is locked outside of the Lion House and are only allowed in as a large group. Once in, they congregate in front of the caging to await the entrance of the various cats housed there.

The public is kept only about three to four feet away from the caging housing each individual cat. Each cage is about ten by ten (depth x width) with a guillotine door opening into them from the exhibit yard. (The animal entrance from yard into exhibit area inside the Lion House is facing the public.) The construction is such that the cat must enter in beneath a ledge (platform) and is directly facing the public area.

PROBLEM:

The male Siberian is reluctant to enter into his cage. His sister enters into her cage quickly and easily while he remains either outside the door hissing, exhibiting fear aggression (dilated eyes, slow crouched movements, ears partially back) or overt aggression (more pronounced symptoms of eye glare, ears flat, striking with paw, and snarling). Aversive behavior is also exhibited at keeper staff when they approach the guillotine control handle, or approach the cage, sometimes it is exhibited at the public.

Sometimes the tiger will enter into the cage only to run back out, or perhaps will only enter part way leaving his body or part of it in the doorway. Once locked in the Lion House caging, he often will exhibit stereotypic looping behavior, a symptom of stress, and often will not eat immediately, if at all.

ANIMAL PROFILE:

This Tiger is extremely cautious and has a timid personality animal. Timidity is defined by level of reaction to new or specific stimuli aversion. He probably was bonded to a female caretaker early on since he seems to be more amiable to females and less reactive to their movements.

In addition, he has a low food drive which is fairly unusual in a large cat. In this scenario it could be that his fear reaction is stronger than his food drive in a high level stimulus situation.

OTHER NOTATIONS:

Further background seems to support the avoidance/fear reaction based on aversive experiences which include: Negative experience in the Lion House upon exiting his crate while being transported into his new enclosure: possible negative reaction due to time constraints in the routine: past historical preference of one sex keeper staff to another.

PROBLEM BREAKDOWN:

Behavior can be broken down into avoidance of entering cage, aversion to keeper staff, aversion to public, low food drive, fear/overt aggression, stress related behavior in a stereotypic pattern.

PRELIMINARY QUESTIONS:

Questions to be addressed by curatorial staff before implementation are the following:

- a)What are the priorities concerning the scenario?
Animal, Keeper, or Public?
- b)Based on the priority what are the preferred options?
- c)How can these be addressed within the current working routine?
- d)How can these be addressed outside the working routine?
- e)Are there any physical changes that can be made?
- f)Are there any timing changes that can be made?
- g)Are there any dietary changes that can be made?

Once these questions are answered the paradigms can be approached and designed from the proper perspective by both staff and anyone else involved. Please see the notations on staff concerns.

APPROACHES:

Complications arise in this scenario since the Zoo is currently in transition from municipal/union operations to a Societal-run facility. Seniority and methodical routines which have been in existence for an extremely long period of time should be addressed.

Currently the keeper with the most seniority operates the routine much the same as it was done in the 1940's. Assessment here regarding priorities and sensitivity regarding the individuals involved are necessary. The keeper's identity is tied to the work and their personal preference is toward lions rather than tigers.

Because of this, this keeper must buy into the effort to correct the situation by allowing someone else to address a scenario they would rather not deal with. Suggestion is to sell the idea to this keeper as a research and training project for one of the newer keepers who is interested in solving the situation. The senior keeper needs to be consulted and asked for suggestions and guidance. They also should be given an outlet for their needs, as in educating the public as they are currently doing.

ACTION OPTIONS:

The following suggestions are recommendations towards solving these problems:

**Cage Aversion
Keeper Aversion
Public Aversion
Fear/Overt Aggression
Stress Related Behavior
Low Food Drive**

Please note these are initial steps and that approximation and desensitization will allow the problems to be eliminated and the original or another similar routine to be resumed at a later time.

- a) Change tiger's routine to where he is not required to enter with the public present.**
- b) Engage female keepers/preferred keepers in desensitization training.**
- c) Reassess tiger's dietary requirements and scheduling.**
- d) Create a positive low stimulus environment.**
- e) Adjust physical setup in Lion House (Ledge moved/removed from above door).**
- f) Integrate all of the above into the routine.**

BRIEF DESCRIPTION OF ACTION STEPS:

Give tiger one or two opportunities to enter on his own and then close that window of opportunity. Time constraints can be added to this directive. Another option is to work with him at another time when there is no public in the Lion House. This will eliminate one of the negative factors which is aversive to him and prevents his entry into the Lion House. Once he enters predictably other steps can be taken.

Objections to changing the routine are outweighed by the benefits and once he is reconditioned he can also systematically be put back on to the original routine without trauma. Other concerns raised are minimal. Please consider these factors:

- 1) His weight is up and the loss of food intake will not be traumatic as evidenced by his lack of food motivation.
- 2) The trauma and stress on the animal will be reduced.
- 3) Valuable staff time will not be engaged in waiting for him.
- 4) As the Zoo evolves the public perception will demand more changes from the old to the new. This scenario could be used as a benefit to eventually change the years of tradition.

Next month: Video Tips for Behavior Studies

(About the Author: Since 1978 Diana has been active both in the U. S. and England working with zoos, private collections, an oceanarium, a marine aquarium, and other animal-related organizations involving captive wildlife. She has a broad base of animal experience involving movie & television training, zookeeping, show performances with live animals, education, behavior management, modification and enrichment, rescue and rehabilitation as well as captive breeding and management of endangered species. She currently works as an Animal Behavior Consultant and Trainer for Ark Animals of California working with both exotic and domestic animals. She has authored numerous articles on animal behavior and training. If you have questions for Diana, you may contact her at 1-800-818-7387 or visit her Home Page at <http://www.ni.net/brookhouse.com>).





Online Resources for the Zoo Professional

*by Carin Peterson, Animal Curator
Austin Zoo, Austin, TX*

Information is important in every field, but in ours it can be vital. Lately, a new and powerful source of information has evolved in the form of online resources. Online resources are those which are accessible through the use of a computer to log into a network. The most common networks available are the Internet, commercial services (ex: American Online), and private bulletin boards.

News of online resources has inundated the media. The public is coming to realize that online resources can be a valuable tool for communication, information retrieval, and business. What does this new technology mean for zoos? Right now, online resources can provide immediate links from zoo to zoo and to other relevant organizations and institutions. Thousands of links already exist, not only to animal related information, but also to information on education, fund raising, business, horticulture, architecture... the list goes on. The future promises to bring advances in access, resources, and availability.

THE INTERNET

The network that the public, researchers, and the media have been focusing on is the Internet. The Internet began as one network in 1969. In the late 80's, cooperation between the United States Department of Defense and the National Science Foundation, led to the formation of the backbone of today's Internet. The name "internet" was originally used to refer to any computer network system. Today it refers to the network, the largest network of them all - containing more than 10,000 smaller networks across the globe on all seven continents. At last count, 146 countries had access to the Internet with Africa being the least wired part of the world. Currently more than 10 million people use the Internet in some fashion, usually through electronic mail (e-mail), which is the most common form of Net access. The number of Net users is expected to increase to 100 million by the end of the century!

AVAILABLE RESOURCES

Following are some of the more commonly used resources with examples of information found through each that could be of use to zookeepers.

Internet Sources

Electronic mail (e-mail) offers access to the single greatest resource on the Internet: people. E-mail works very much like regular mail, although much

faster. In addition to correspondence, it is also possible to do searches, and send and receive sounds, images, and executable programs. Mailing lists and Listserve groups, available through e-mail, redistribute mail to all their subscribers and serve as a way to reach a few, or a few thousand people who are interested in a specific topic. Two examples of Listserve groups available through e-mail are:

-CONSLINK (listserve@sivm.si.edu) - run by the Smithsonian Institution's Conservation and Research Center. It covers all aspects of biological conservation.

-CAMEL-L (listserve%sakfu00.bitnet@vtvml.cc.vt.edu) - run by the Camel Research Center at King Faisal, Saudi Arabia. It covers the field of camel research and study.

Usenet Newsgroups serve as virtual forums for the electronic community. The forums are divided into 20 major hierarchies or varied areas of interest. Users post messages to a newsgroup, which is then forwarded to all subscribers of that newsgroup. In January of 1994, there were 7,000 newsgroups with 20-30 being added every week. Some examples of Usenet Newsgroups are:

-clari.news.interest.animals - contains recent stories of animals in the news.
-sci.bio.herp - covers discussions on the biology of reptiles and amphibians.

Gopher is a tool that allows access into remote computers permitting browsing and searching of collections of documents. Gopher can also provide links to databases. Two gopher resources are:

-The Primate Information Network (uakari.primite.wisc.edu) - maintained by the Wisconsin Regional Primate Center. It offers primate based information including taxonomy, audio-visual resources, bibliographies, and Primate Talk, a discussion forum for primatologists.

-NETVET (vetinfo.wustl.edu) - contains veterinary information including journals, conference proceedings, lists of organizations, and animal resources.

The World-Wide-Web (WWW) is a system for organizing, linking, and providing easy access to related Internet files, resources, and services. When reading documents in the Web, it is possible to click on highlighted words or phrases to jump to definitions, other sources, and related documents anywhere in the world. Some resources on the web are:

-DeerNet (<http://cervid.forsci.ualberta.ca/deernet/deernet.html>) - contains links to the electronic journal Cervus and worldwide ungulate research stations, as well as pictures of the world's ungulates.

-The Penguin Page (<http://www.vni.net/~kwelch/penguins.shtml>) - contains information on penguin behavior, reproduction, and predators.

-ZooNet (<http://www.mindspring.com/~zoonet/>) - includes zoo news, links to zoo pages, and lots of animal links.

-Electronic Zoo (<http://netvet.wustl.edu/e-zoo.html>) - this is probably the most comprehensive list of animal related computer resources.

File Transfer Protocol (FTP) is a tool used to move files from one computer to another. Text files, pictures, sound files, and programs can all be accessed through FTP. Many university departments have information available in FTP files.

Other Online Sources

Commercial Providers such as CompuServe and America Online are large computer systems that offer a variety of services that now include Internet and database access.

-CompuServe offers access to the Life Sciences Collection database.

-America Online offers the Pet Care Forum which includes two discussion groups for zookeepers.

Bulletin Boards (BBS) are small dial-up systems designed for local users, although many are now available over public networks. Some BBS provide conferencing capabilities. Most are very specialized, dealing with one particular topic. An example of Bulletin Board is the:

-Enviro BBS (703-524-1837) - which holds discussions about environmental protection, wildlife, endangered species, and natural resources.

Online Libraries are available through the Internet, commercial providers, and subscription. Most only provide bibliographic record searches, not the full contents of the books. Some offer access to online journals, searchable databases, and Internet assistance. The majority of large universities have their entire library catalog systems available online. An example of an online library is the:

-Illinet Online Catalog (telnet-illinet.aiss.uiuc.edu) which contains 40 Illinois libraries, including the entire Chicago public library system and almost every Illinois university library. In addition, over 800 other libraries may be accessed from Illinet.

The future of online resources promises to be exciting. Their potential is just beginning to be realized. Already, the amount of information available is overwhelming. Imagine what 100 million users will provide! The tools for online searching are still in the development stages and, so too are the sources themselves. Both the United States Congress, and the business community want to develop and fund the National Information Highway (NIH). This means that in the future, Internet and online access will be as widespread as telephone access. It is impossible to know at this time how this new technology will affect our field. The most obvious changes that will be seen are more users, more sites, and more services. This should mean better channels of communication, increased information, and more ideas. Utilization of these resources will benefit ourselves as professionals, our field, and our animals.

Note - Due to the ever changing nature of electronic resources, the addresses/ phone numbers for those mentioned above may have changed since this paper was written.

Editor's Note: The following is an additional list of sites you might like to visit on the World Wide Web. This list, in part, was provided to the AZA Communiqué by L.H. Baptista. Other sites were added by this office.

1. AAZK: <http://aazk.ind.net/>
2. C.A.U.Z.: [gopher://gopher.vax.csun.edu](http://gopher.vax.csun.edu)
3. Zoo and Animal Park Legislation: [gopher://gopher.legislate.com:7005/](http://gopher.legislate.com:7005/)
4. New Orleans Zoo: <http://www.swiss.ai.mit.edu/phil/summer94/new-orleans-zoo.html>
5. Sea World/Busch Gardens: <http://www.bev.net/education/SeaWorld/homepage.html>
6. Seneca Park Zoo: <http://www.eznet.net/rochester/todo/sights/zoo/zoo.html>
7. Stephen Birch Aquarium-Museum: <http://aqua.ucsd.edu/>
8. Zoo Atlanta: <http://www.gatech.edu/3020/zoo/home-page.html>
9. Indianapolis: <http://www.biology.iupui.edu/indyzoo/>
10. National Zoo: [gopher://gopher.american.edu/1/dc/zoo](http://gopher.american.edu/1/dc/zoo)
11. Brazilian Zoos Census: <http://www.ftpt.br/cgi-bin/bdnet/zooplantel>
12. AZA: <http://www.AZA.ORG> (offers access to individual AZA institution Web Pages)
13. Orangutan Foundation International: <http://www.ns.net/orangutan>
14. San Diego Zoo: <http://www.sandiegozoo.org>
15. Defenders of Wildlife: <http://www.defenders.org>
16. U.S. Fish and Wildlife Service: <http://www.fws.gov/>

Napsacks

Napsacks are specially designed primate sleepers. They provide comfort and an improved quality of life for these incredible creatures. The material used is cool enough for warm conditions and thick enough to prevent chilling in those cold winter months. Made from soft and durable cotton canvas, Napsacks are completely machine washable and attach to any thin horizontal bar in your existing exhibit. U-bolt brackets are also available for attachment to vertical bars. (Please enquire when ordering).

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(201)-422-9337

Legislative Update

*Compiled by Georgann Johnston
Legislative Advisor
Sacramento, CA*



Wood Stork Subject of Draft Recovery Plan

The U.S. Fish and Wildlife Service has announced that the revised draft recovery plan for the wood stork is now available for public review and comment. The wood stork is found in Florida, Georgia and coastal South Carolina.

In 1984, the wood stork was listed as an endangered species by the USFWS primarily because of loss of feeding habitat, human disturbance, and man-made changes in water levels that affected the natural drainage patterns of Florida. Over the past 12 years, USFWS has estimated the population of these birds to range between 5,500 and 6,500 pairs.

The agency has now drafted a revised recovery plan, based on following selected bird populations for ten years. Many of the tasks identified in the original plan have been accomplished and more information is now available on the biology and distribution of storks throughout the southeast. The revised plan updates the original information and adds data about new threats and needs.

Comments on the draft recovery plan must be received by 24 May 1996 to ensure consideration by the USFWS. Copies of the document or further information can be obtained from Linda D. Finger, Acting Field Supervisor, USFWS, 6620 Southpoint Drive South, Suite 310, Jacksonville, Florida 32216, (904) 232-2580.

Source: Federal Register, 25 March 1996, volume 61, number 58

Porpoises Threatened by Scotland's Proposal to Return To Monofilament Fishing Nets

Scottish Office Minister Raymond Robertson has proposed that the government lift a ban on the use of monofilament gill nets. These nets have been implicated in the drowning deaths of porpoises and dolphins in the waters of a number of European nations.

The proposal by Minister Robertson was in response to a plea by members of the Scottish fishing industry for measures to improve their ability to compete with other nations in fish production.

The Royal SPCA and World Wide Fund for Nature, along with seven other animal interest groups have filed a formal complaint with Robertson's office, pointing to the recent "dolphin-safe tuna" controversy in the United States. As of this writing, no final decision has been made on the lifting of the ban.

Source: Animal People: News for People Who Care About Animals, Mar. 1996, Vol. 5, no. 2

Follow-up on California Mountain Lion Initiative

In the February 1996 issue we reported that California voters were set to decide whether a ban on the hunting of mountain lions (cougars) was to be lifted and the sport reintroduced to the state. An election in late March, which saw a turn-out of only 29% of eligible voters, saw a defeat of the measure by a margin of 58% to 42%.

Information concerning campaign funding is still being tabulated but preliminary information shows that both the opponents and proponents of the measure were about equally matched financially. The interesting difference to date shows that proponents of a return to sport hunting garnered approximately \$500,000 in funding, with a single contribution of \$100,000 coming from the National Rifle Association. Conversely, the \$500,000 raised by the opponents of the measure came primarily from individual donors and smaller environmental organizations, with no single contribution even approaching the funding from the NRA.

Representatives of two groups who acted strongly to counter the measure, the Mountain Lion Foundation and the California Wildlife Protection Committee, reported that their efforts were aided by multiple newspaper editorials opposing the initiative. These same organizations also report, however, that the proponents have vowed to continue their push to legalize mountain lion hunting as a "public safety issue", and that they intend to approach the California Legislature sometime this year with a new, virtually identical proposal. This action stems from two deaths in the last year of people who were mauled by mountain lions while hiking in the animal's natural habitat.

Source: Personal contacts with Mountain Lion Foundation and California Wildlife Protection Commission, 5 April 1996

America's Wetlands Still Under Attack by Congress

Last May, the House passed H.R. 961, which proposes to repeal significant portions of the Clean Water Act, including the stormwater permit system, secondary sewage overflow program and, most significant for AKF readers, deletion of meaningful protection for wetlands. The Senate has been considering a companion measure, S. 851 or the Wetlands Reform Act of 1995, but no action has been taken on that bill since the beginning of 1996.

Both H.R. 961 and S. 851 propose to exclude up to 75% of current wetlands from any protection whatsoever. This would have a significant impact on numerous fish, amphibians, birds, and riparian-dwelling mammals should the two bills pass and eventually be enacted into a single law. The current Clean Water Act, much like the Endangered Species Act, requires reauthorization to keep it in effect. These bills would significantly modify the legislation and turn it into what some environmental groups refer to as the "Dirty Water Act" should the matter make it through both houses of Congress and achieve a presidential signature.

On a more positive note, earlier this year Congress did pass H.R. 2099, titled the VA-HUD and Independent Agencies Appropriations bill, which contained many harmful riders including provisions to prevent the Environmental Protection Agency from enforcing and/or implementing provisions of the current Clean Water Act. Fortunately, the bill was vetoed by President Clinton.

Source: Marine Conservation News, published by the Center for Marine Conservation, Spring 1996, vol. 8, no. 1; Senate and House Bill files via Thomas, a World Wide Web directory of governmental publications 8 April 1996.

Additional Wolves Introduced into Yellowstone National Park

On 2 April 1996, the U.S. Fish and Wildlife Service released 11 additional wolves into Yellowstone National Park. The wolves were part of a group of 17 transported from Canada to the United States in early 1996. The USFWS is very optimistic about the release project and reports that further reintroduction of wolves may not be needed to provide a stable wolf population in the Yellowstone ecosystem. On a negative note, the Service also reported that in early April a female wolf from a previous release was found shot to death. (Ed. note: 4 more wolves were released in mid-April).

Source: GREENlines, the Grassroots Environmental Effectiveness Network, 8 April 1996, Issue #96.

Comment Period for Spotted Owl Draft Environmental Report Extended

This column previously reported the availability of a Draft Environmental Alternatives Analysis for special rules regarding the conservation of the northern spotted owl on non-federal lands in California and Washington. The comment period was to end in early April but has now been extended to 3 June 1996.

To review, the proposed special rule deals with impacts of forest practices to the northern spotted owl. A complete copy of the document may be obtained via the World Wide Web at <http://www.rl.fws.gov/4deaa/welcome.html>. Further information can also be obtained by contacting Curt Smitch, Assistant Regional Director, Region 1, USFWS, 3704 Griffin Lane S.E., Suite 102, Olympia, Washington 98501, (206) 534-9330.

Source: Federal Register, 8 April 1996, vol. 61, no. 68.

Interior Dept. Appropriations Bill Restricts Environmental Issues Funding

Numerous appropriations bills are pending before Congress, including H.R. 1977 which is titled the Department of the Interior and Related Agencies Appropriations bill. This legislation includes funding for the National Parks Service, the Environmental Protection Agency, the Forest Service, and the National Zoological Park, all as subdivisions of the Department of the Interior. Some of the provisions of particular note for those interested in animal welfare or environmental issues include a restriction on the use of funds to promote the Endangered Species Act, a limitation on funding for the National Biological Survey, a repeal of the Outer Banks Protection Act, and a limit on funding for the Smithsonian, the National Zoological Park, and the Institute of Museum Services.

As of this writing this appropriations bill, like most others, is tied up in Congress while interim emergency funding measures are repeatedly passed to keep the federal government operating.

Source: Congressional Information Server, 8 April 1996.

Contact Numbers:

President Clinton (202) 456-1414

President Clinton's Comment Line (202) 456-1111

The Capital Switchboard (202) 224-3121 (ask for your Senator/Representative's office)

The Philadelphia Story - A Keeper's Grief

*By Julie Unger, Lead Keeper / World of Primates,
Philadelphia Zoo, Philadelphia, PA*

In the wee hours of Christmas Eve 1995, an electrical fire at the Philadelphia Zoo's World of Primates facility cut short the lives of 23 endangered primates. Along with our entire gorilla troop, three Bornean orangutans, four white-handed gibbons, six ringtailed lemurs, two ruffed lemurs and two mongoose lemurs died of smoke inhalation. The tragedy has clearly been labeled the worst disaster in the Zoo's 136-year history and one of the worst at any zoo in the world.

Needless to say, the event has an enormous impact on the lives of the humans left to mourn the animals. According to many, the initial shock was to jolt to all the senses, but rather surreal in comparison to the many stages of grief which were to follow. Grief counselors were immediately brought onto Zoo grounds, and while it was made mandatory for all primate keepers to meet with them, many other staff members elected to use their services as well. The Zoo remained closed for a week, and upon reopening, set up a "Remembrance Gallery" for the public. This collection of poems, photographs and other memorabilia served as a tribute to what the animals had accomplished during their lives. It also allowed the Philadelphia community to share our sadness, while trying to regain the happy memories and comfort one another.

While I expected a wealth of caring from local people, I was astounded by the incredibly quick outpouring of support and concern from people not only across the country, but around the world. Flowers, cards, faxes and money came pouring in, evidence that this tragedy had touched even those unfamiliar with our wonderful individuals.

The idea that a person who had never visited Philadelphia could be completely devastated by this tragedy made me aware of how deeply devoted to animals some people are. This realization gives me great hope for wild populations of all species.

My personal grieving process paralleled that of many. The initial enormity was too much to comprehend, but before I was even able to think about our purely unique individuals, I slowly began to mourn each species we lost. One by one. Systematically. It was as if my mind allowed me to move on only when my body was able to handle the next hurdle. After I finally internalized the fact that every one of "my" gorillas had died and started to think about the oranges, the shock hit once again, and with almost the exact intensity of the initial blow. The same process followed in dealing with the deaths of the gibbons and the lemurs. The whole experience was exhausting.

Seeing the soot-darkened building and touching several of the animals' bodies were the acts which made this nightmare a true reality to me. My final and most difficult task now is to come to terms with the fact that, except for in memory, many specific individuals who touched me deeply are gone from my life forever.

As a zookeeper for nine years and lead keeper of the World of Primates for the past two years, this was by far the most crushing animal tragedy I could ever have imagined. The public really cared and seemed to have an insatiable thirst for information. By circumstances of my position, I seemed to get the lion's share of interviews, and while some of my co-workers viewed the interviews as invasions of privacy, others, like myself, welcomed them as tools of healing. Talking about gorillas (which at one point was unthinkable) became easier and easier. In retrospect, I often feel guilt pangs because while I cherished all of the animals, my first love, my expertise and my main charges were the gorillas. I was so consumed with thoughts of them that I feel I neglected to give the others the recognition they deserved.

After I spoke with reporter after reporter, I realized I was answering questions in a rather schizophrenic manner. Depending on my emotional state at the moment, I would swing wildly between keeping a "professional distance" from my emotions and giving in to them completely. When I felt strong and "in control", I spoke of the event's impact on captive breeding programs, the loss of genetic diversity, and how important it was that our gorillas were mother-reared. Discussing our animals' wild gene pool and healthy sense of community made me feel a profound loss for the entire world. I was immediately reminded of words from the late Gerald Durrell. He likened conservation efforts to a large wonderful spider web. When just one strand is severed, left is a huge gaping hole and a shudder which travels through the entire web. Standing, in a sense, right next to one such hole, I felt that shudder over the entire earth and to my very core. I spoke of how our animals served as ambassadors to their wild cousins.

On the other hand, more often than not, reporters would catch me at more vulnerable moments. Tears would brim at the memory of anything I loved which I would never see again...which is everything! The memory of John, our startlingly handsome silverback, sitting upright and holding his toes; the joy I felt at the birth of Maandazi, our newest troop member (who was due to turn one year old just weeks after the fire); the pride I felt recently after winning over Snickers (the troop's dominant female) with back rubs; and the stubborn teenage "battles-of-wills: I had recently been experiencing with goofy, nutty Kola. I remember tomboy Tufani and sweet, sweet Samantha, whose necropsy confirmed a suspected pregnancy. I cried for what was lost and for what was never found. I cried for myself.

While the shades of grief felt on professional and personal levels differ greatly, so too are the types of comfort derived. Personally, when I think of worried-filled separations and joyful hug-filled reunions when a gorilla briefly left the troop for a vet visit in the past, I am grateful that they all left this earth together, leaving none to fret or mourn. I am also incredibly comforted that none encountered flames. Instead, smoke overcame them as the majority slept silently in their nests, babies curled up against their mothers. Absolutely no indications of stress.

On the professional front, I know the Zoo is committed to a strong gorilla program in the future. While I am currently feeling quite displaced professionally, I do plan to get back on track, wiser and with a heightened sensitivity. I know my sense of purpose will return as wounds heal. I know that this loss will only increase my, the Philadelphia Zoo's, and, I hope, the world's determination to do right by the animals in our care and the natural world they represent. I am eternally grateful that our animals have offspring at other zoos.

While the animals which died are replaceable as specimens, they will never be replaceable as the unique creatures they were. Their intelligence, their compassion, their ability to understand made me feel as though they were the most special of friends. I feel confident that our entire staff gave them our very best we had to offer. I feel honored to have been a part of their lives, and a better person for all that they gave back to me. Goodbye my sweet friends.

Memories.....

Bornean Orangutans

"Samarinda" - I was there at the airport when "Sammy" came to Philadelphia. He seemed to take everything in stride and this calm gentle nature continued throughout the short time I knew him. He was very sweet and trusting and these special qualities were especially apparent as his former keeper Scott Temple "handed" Sam over to us. I instantly knew we'd be friends.

"Rita" - A mostly mellow animal with an occasional strong-willed streak. Rita did appear unusually wise. I often had the feeling that she knew something I didn't. Rita was a dedicated mother and Dr. Birute Galdikas admired her striking and pleasant appearance.

"Jingga Gula" - 100% adorable! I'll never forget her during our recent introductions to Samarinda. The door was set up in a creep situation where Jingga alone could fit through. As it was opened, she'd dart away from her mother and run towards the door - but at the very last second she'd extend her foot so that Rita could pull her back! Eyes that were filled with wonder.

Gibbons

"Blackie" (or "Gibby") - Once grabbed a keeper's lunch tray and pulled it into his cage through a drain opening. I'll never forget the sight of him holding a spare rib with a huge blob of Bar-B-Que sauce on his nose. Would stomp his feet when frustrated but could easily be won over with a good head scratch,.

"Mommie" - Seemed to melt when she had her hands and feet groomed. Looking rather worn-out towards the end, but given her age record and her reproductive history, amazingly good.

"Yao" - A bundle of energy. A true energetic acrobat when outdoors, but at night when he'd cuddle up to go to sleep, he looked like the calmest, sweetest of angels.

"Octavian" - The interspecies play he engaged in with Jingga was incredibly touching. It was as if they really saw past each other's exterior. If only humans could behave this way. Because he was our only blond gibbon and he was the youngest, it was an especially wonderful sight to see him in Mommie's arms at night.

Ringtailed lemurs

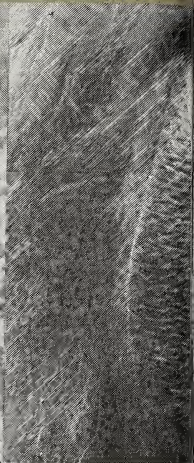
Absolute sun worshipers. I still break up when I watch them prancing through the sunshine in a film put together as a tribute to the WOP animals. This particular segment is done in slow motion and it captures the group's apparent gusto for the outdoors. They appeared so free, even in captivity.

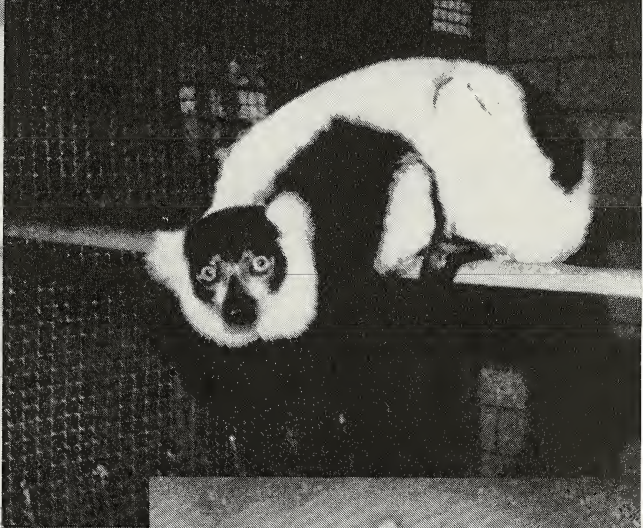
Ruffed lemurs

I developed a true appreciation of this species when I visited Duke University Primate Center. These two could sound off and sound like a large group, but when left alone, they would often "clown" and hang from the branches by their toes.

Loved, Lost and Remembered...

Clockwise from center top:
1.0 Bornean orangutan Samarinda (*Rich Killion Photography*); 0.1 Bornean orangutan Rita with her 0.1 offspring Jingga Gula (*Rich Killion Photography*); Black and white ruffed lemur; Ring-railed lemur; author Julie Unger (seated by window) views Lowland gorillas 1.0 Chaka (left, now at The Cincinnati Zoo) and 1.0 Samantha holding infant 0.1 Tufani; White-handed gibbons 0.1 Mommie being groomed by 0.1 Moe; Lowland gorillas (1 to r) 0.1 Tufani, 0.1 Samantha, 0.1 Snickers and 0.1 Maandazi in Snicker's arms; Inter-species interaction between 1.0 White-handed gibbon Octavian and 0.1 Bornean orangutan Jingga Gula (*Concertpix/Dana B. Grubb*); 0.1 Lowland gorilla Kola (*Concertpix/Dana B. Grubb*). Center photo is of 1.0 silver-back Lowland gorilla John. Photos not directly given a photo credit were provided by Keepers Julie Unger, JoAnne Adams, and The Philadelphia Zoo.





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Perhaps the greatest loss of all, genetically-speaking. But aside from that, I feel the loss profoundly as I know there was much more to be learned from these rather shy, quiet creatures. They were much more subtle in their mannerisms than the gorilla antics I had become accustomed to.

More Keepers Speak on Their Loss....

JoAnne Adams, Primate Relief Keeper: Each of us at the Philadelphia Zoo heard about the fire at different times and in different ways. The depth of reaction was just as varied. To try and grasp the reality of so many animals being gone was immense. Add to that the holiday and our own self-inflicted conviction to "be joyful" for our friends and family and you can begin to understand our frame of mind. The fact the zoo is normally closed to the public Dec. 24th and Dec. 25th was helpful. Having our Director make the decision to stay closed till after Jan. 1st gave us time to begin to grieve and prepare for dealing with the public.

The process is ongoing. Seeing the support offered during January alone showed we were not alone. Our "Remembrance Gallery" received between 30,000 and 40,000 visitors. The cards, posters, pictures and other condolences will probably be double that and more. Even now, area schools and businesses are still raising money to help.

With this article, we would like to try and share our thoughts on why the 23 spirits lost on December 24, 1995 will be greatly missed.

As the weather begins to warm, another phase of our grieving will approach. Walking past the exhibits, which physically haven't changed, we will expect to see and/or hear the animals. Many of our administrative staff have expressed how difficult this spring will be to work in their offices without being able to hear our gibbons vocalizing.

I believe we were the first U.S. zoo to exhibit oranges and gibbons together. Our adult gibbons were together a long time. "Mommie" was a great educational example for genetics - she had eight offspring, two were blond. Many keepers favored her as she could be content to have a hand or foot held all day. It's hard to figure who relaxed more from this, her or us. Her mate, "Blackie", was devilish. For myself, once I began to give him individual attention, he became my favorite gibbon. His mischievous ways with the oranges brought about a great story. He worked on pestering our then male orang "Bim" — darting in and out, pulling hair or yanking a "blanket". Bim finally caught him and was pinning him to the ground when a employee came by and yelled for him to let go. He did, by way of throwing "Blackie" at the building. "Blackie" wasn't hurt, but he was thereafter more selective of his opportunities.

What surprised us most about this mixed species exhibit was the "friendship" that developed between our two young gibbons, especially the youngest, and our young orangutan. They spent hours playing in the trees. We were visited by Dr. Birute Galdikas and she had never seen this behavior in the wild. Luckily, we have film of them interacting.

Our adult female orang, "Rita", was best described by Maria Schwalke, her permanent keeper. "Rita was one of the most profound animals I have known. the depth of consciousness one could see in her eyes was almost unfathomable. She seemed so wise and nothing much seemed to faze her." To me, she was the first animals to keep me on my toes, both in how to set up the exhibit and how to figure her out.

As for "Samarinda", our newest male orang, we were all impressed by his size, but his range of noise making to get our attention was unforgettable. He was very gentle and mellow and could be a real goof - like he never got over being a kid.

Our gorillas have been described as unique since our three adults came in two small groups from the wild and lived together without major changes for 26 years. Even though they were "hand-raised", all their offspring were mother-reared. The oldest, "Jessica" is now mother-rearing two babies in San Diego with need of human intervention. As usual, our silverback "John" was a big favorite. To be boastful, the most common description of him was handsome - even from the public. Personally, my fondest recollection was hearing him laugh while tickling him. Our two females went from two to six years between kids, so there was always some activity in the group. Since most marriages don't last very long anymore, it is a statement to this troop that 26 years went by as well as they did and would probably have continued until one of the adults died.

Each of our animals had distinct personalities and to try and convey their true spirits would take more room than the *Forum* could hold. Please realize that they were uniquely special to each of us and will always live in our memories. We deeply appreciate everyone's sympathy, support and generosity offered since December 24, 1995.

Robert Berghaier, Assigned Relief Keeper: The shock and the sorrow that have resulted from the World of Primate fire continue to reverberate through our institution and the zoo community as a whole. I have found the fire and its aftermath to be the most difficult tragedy I have had to deal with, personally or professionally. I started working with our adult gorillas in the fall of 1978. From that date, I either worked with them directly as a full time or assigned relief keeper, or indirectly as a relief keeper or keeper supervisor. We watched John, Snickers, and Samantha as they changed from gawky adolescents to mature breeding adults. We saw the results of our hard work to initially integrate the group come to fruition with the birth of nine youngsters. Two of these youngsters, Jessica in San Diego, and Chaka in Cincinnati, have offspring of their own. We helped carry the group out of their old quarters to what we hoped would be a long and bright future in the new World of Primates exhibit. All this work and our bright hopes were dashed on December 24th. Yes, we will carry on and there will be new animals to care for and care about. However, none of us who worked closely with this special group of animals will ever be the same.

Chapter News Notes

Kansas City AAZK Chapter

The Kansas City AAZK Chapter is very excited about our 9th Annual Bowling for Rhinos which will be held on 18 May. Events will be held at two different bowling alleys because of Junior League activities. This year we put together a corporate brochure to send out and we will be doing educational programs for schools participating in donating school supplies. We will even have a large paper-mache rhino with a banner outside the main bowling alley for a couple of weeks before the event!

Donations of up to \$50.00 were given to the following organizations by our Chapter: Adopt-an-Acre, Adopt-a-Marine, Cheetah Conservation Fund, Crane Foundation, Dian Fossey Gorilla Fund, Jane Goodall Institute, League of Conservation Voters, Manatee Foundation, Marine Conservancy Fund, The Nature Conservancy and the World Parrot Trust.

We also voted to donate \$200.00 to AAZK, Inc.

We would also like to thank the National AAZK Board Members for making a visit to the Kansas City "New Zoo" a part of their mid-year meeting. We enjoyed giving them a tour (covering alot of ground!), sharing lunch and the potluck dinner, and being able to talk with all of them.

—Penny L. Cram, Chapter Liaison
Jenny Shillcox, Secretary

San Diego AAZK Chapter

Spring is a busy time for our local AAZK Chapter in San Diego, lots of old business to wrap up and new business to begin.

In January, we invited Animal Care

manager/Gorilla Tropics Lead Conrad Schmitt to discuss the AZA Management School and networking within the profession. The topics peaked the interests of many of our staff and was well attended. Besides being very informative, Conrad was very encouraging and positive regarding the role keepers play and the contributions they can make. He has since left our institution and will be sorely missed.

We are trying to coordinate our monthly meetings with topics from countries being celebrated during our Zoo's 80th birthday celebration. In keeping with the theme for February, we heard from Animal Curator Karen Killmar on the Vietnam Primate Conservation Project. We had several students from the local universities attend as well as numerous volunteer researchers. Karen showed us beautiful pictures of Vietnam and told us of the many joys and disappointments of their trip - one of the joys being the friendliness of the people and one disappointments being lots of leeches! Their greatest sorrow was the lack of wildlife that they saw actually in the wild and the abundance that they saw in the marketplaces. Thank you so much, Karen, for enlightening us to another much needed and under emphasized conservation project.

From the Department of Anthropology at UC San Diego, we heard from Chris Johnson, Ph. D. in March. This well-attended meeting again hosted several local students and researchers as well as our regular members. Dr. Johnson discussed the gaze-mediated behavior of pygmy chimpanzees as well as showing some fascinating video. We all learned a lot from her knowledge and research.

We are currently focusing our attention in several areas: Board elections, Bowling for Rhinos, *the Keeper*, and the future of the Animal Buns calendar. We wish you all as beautiful a spring as we're having and hope your Chapters are doing well.

—JoAnn Haddad, Chapter Liaison / Sec'y

Development Of A Crisis Management Team In A Zoological Institution

*By William K. Baker Jr., Biologist, Zoologist
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Lufkin, TX 75904-5560*

Abstract

As most zoological institutions are located in urban centers, receive high volume traffic, and are increasingly called upon to hold more species due to declining resources in the wild, the opportunity for a crisis situation to develop increases proportionately. This crisis could be the result of natural disaster, public interaction, containment failure, or zoo keeper error. The need for a trained team within the institution to react to a crisis situation is imperative. By utilizing individuals from within the zoological institution it is possible to address the problems of escape, injury, public relations, and limit liability.

Introduction

In recent years zoological institutions have grown to meet the increasing demands of the industry. As natural resources continue to decline, facilities expand and renovate existing exhibits to fulfill their growing responsibilities as conservators of the wild. Increasing numbers of environmentally conscious visitors seeking entertainment, education, and contact with the "Nature Experience" visit facilities annually. Due to population growth in major urban areas many facilities have effectively become immersed and exist as an oasis surrounded by concrete.

As a result of the increasing demands placed on zoological institutions, it is inevitable that human-animal interaction will increase. Every few weeks, the media carries a report of an animal incident at either a public or private facility. These are not isolated events, but occur on a regular basis worldwide. The causes of these incidents can result from natural disaster, public interaction, containment failure, or zoo keeper error. It is for these reasons many institutions have established emergency procedures and designated certain members of their staff to respond to the zoological crisis situation.

Emergency Response Team- ERT

Historically, zoological institutions have relied upon a system of using the most senior staff member on the scene to take control of a crisis situation. This individual may be in control until the situation is resolved or until relieved by a more senior staff member. In theory, this does not seem to present a problem. However, in larger institutions where there is a diversity of management personnel, the person in charge may lack animal management experience or crisis intervention skills. In order to prevent this situation many institutions have established an Emergency Response Team (ERT). An ERT can best be

described as a group of staff members who have expressed an interest in participating in an emergency response program and who have either training or prior experience in the areas of animal management and crisis situations. This prior experience can be in animal capture and restraint, animal transport, firearms, or preparation for natural disasters.

The ERT is typically overseen by senior staff members who coordinate the training and the crisis response. However, not all senior staff members who respond to a crisis situation have experience in animal management; which in effect, places the ERT under the control of the most senior staff member on the scene, who may not be the best choice for the situation. In my personal experience as an ERT member and Shoot Team Leader, I found myself in exactly just such a situation. After the crisis was resolved, it occurred to me that while the ERT is an excellent idea in principle, it could evolve into something more effective, the Crisis Management Team.

Crisis Management Team- CMT

The Crisis Management Team (CMT), is a team of individuals who are selected from a zoological institution's staff, who are then trained in animal management, containment, restraint, and transport, crisis management, CPR, first-aid, fire safety, firearms safety, and marksmanship. This team would operate outside of the normal chain of command in a crisis situation, answering only to the Director or Assistant Director of a facility. In their absence, the CM Team Leader would have complete control and responsibility for resolving the crisis situation. Ideally, the CM Team Leader should be a Curator or Assistant Curator, thereby assuring that management is represented in a crisis situation. The CMT would be broken down into five task-oriented sections: Logistics, Security, Capture, Containment, and Veterinary. Each section would be supervised by a Section Leader who would direct the actions of their personnel and coordinate with the CM Team Leader.

Logistics Section-

Duties would include providing the necessary technical support for supply, maintenance, repairs, construction, and transport in a crisis situation. This would include providing Emergency Support Equipment to maintain operations, if normal services to the facility were disrupted.

Security Section-

Duties would include securing the immediate perimeter of the event site, directing staff and visitors to safety, and restricting access to the event site to CMT personnel.

Capture Section-

Duties would include the transport of capture equipment to the event site and the actual capture, restraint, and transport of an escaped or injured specimen.

Containment Section-

Duties would include the transport of weapons to the event site, containment of dangerous animals, and providing support to the Capture and Veterinary Sections.

Veterinary Section-

Duties would include the transport of medical equipment to the event site and the sedation and treatment of injured animals.

Training

In order for the CMT to be effective, it is essential that all team members receive specialized training. Training in animal management, containment, restraint, and transport can be facilitated by the institution conducting a series of workshops with the various animal services departments. These workshops would provide team members with a common frame of reference of the specific management needs of the various sections that compose a diverse animal collection.

Additional training is often available through the many non-profit organizations in the surrounding area. First-aid and CPR training is available from the local chapter of the Red Cross. Training in MSDS, Haz-Mat, SCBA*, and fire safety is often available from the local fire department. Firearms safety and marksmanship training is available through state Hunter Safety Programs and the NRA. Medic First Aid and Oxygen Provider programs are available for a nominal fee through PADI for personnel who are SCUBA qualified and work aquatic exhibits.

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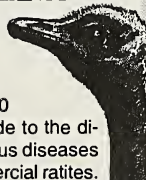
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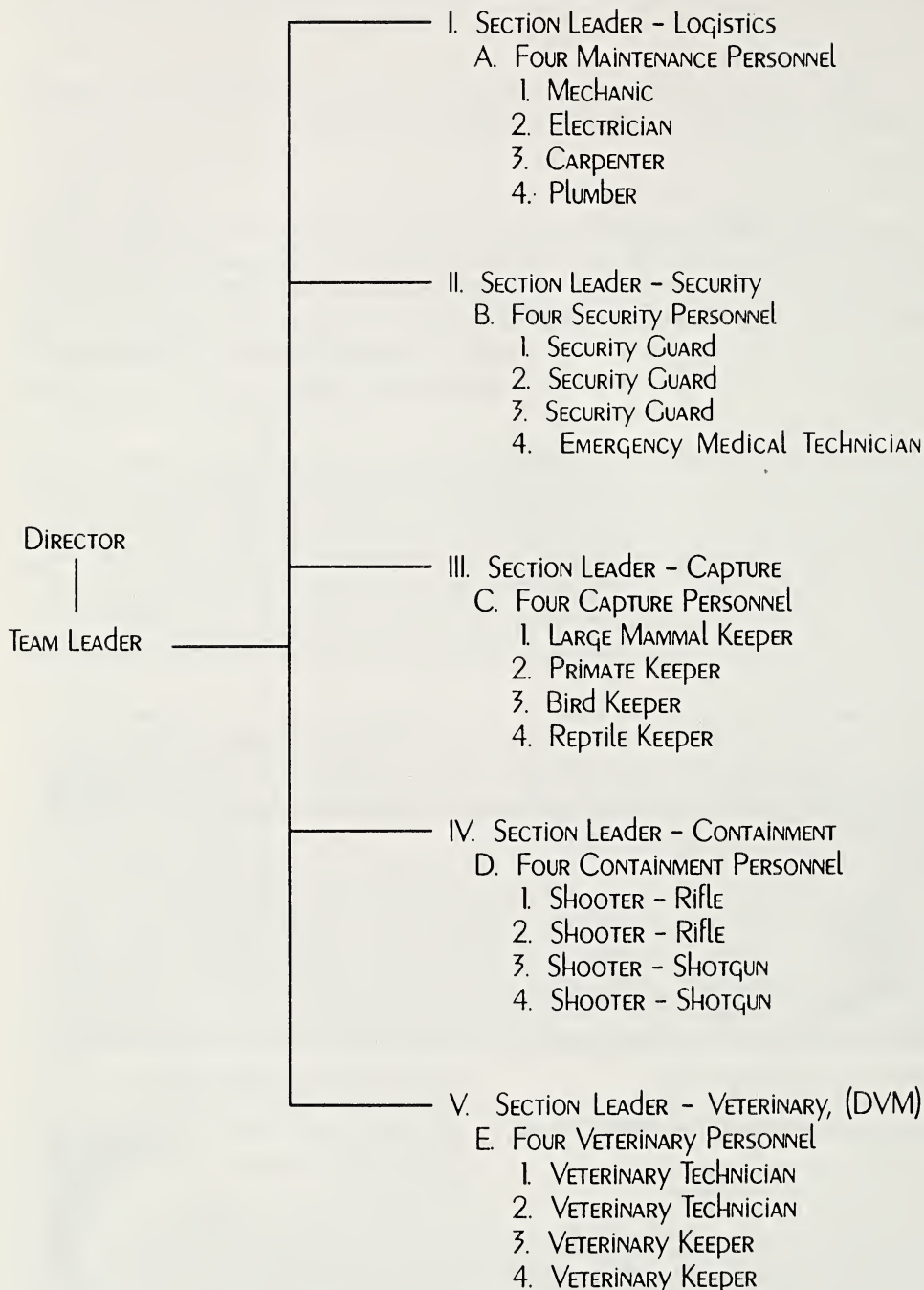
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CRISIS MANAGEMENT TEAM - CMT



TOTAL PERSONNEL: 26

Specialized training alone is not enough, team members should practice their skills. The CMT should meet, discuss, and develop written guidelines. Practice scenarios should be held once a month, even if the weather conditions are inclement. The Containment Section should schedule firing range practice once a month and conduct annual marksmanship qualification. The institution can test its overall readiness for the crisis situation by conducting quarterly practice drills. Using this approach, an institution can develop a low cost, high quality training program, that requires only effective time management.

Equipment

The institution should maintain dedicated equipment that is stored in a central location of the facility for CMT usage. This storage area would ideally have adequate capacity, limited access, and provide sufficient work space for the sections to perform routine maintenance and repair of their equipment. The dedicated equipment would be in addition to the existing fire, safety, and capture equipment kept in the keeper work areas.

Examples of dedicated equipment would be entry tools, tool kits, generators, flashlights, lanterns, radios, batteries, first aid/trauma kits, fire extinguishers, backboards, capture nets, shields, animal poles and hooks, animal stretchers, video camera, binoculars, ammunition, and firearms.

Operations

In a crisis situation (e.g. animal escape), staff members would be notified of the nature and location of the event. Unaffected staff members would automatically secure all animal operations and stay in their work areas, while facility security assisted visitors to safety. The CMT would report to the storage area, retrieve the appropriate equipment, and transport it to the event site. At the event site the Security Section would set up a perimeter, providing a work area for the Capture, Containment, and Veterinary Sections. The Logistics Section would take up a reserve position behind the perimeter. A designated member of the CMT should begin video taping the event to provide a permanent record for critique and liability protection. All activity at the event site would be directed by the CM Team Leader, who would update the Director as the situation develops. Whenever possible, the CM Team Leader should consult with the supervisor of the affected area and the Veterinary Section Leader, (DVM) to find the safest resolution to the situation. After the crisis is resolved, equipment would be serviced and returned to storage, and all involved staff members would meet to discuss the cause, response, and possible prevention of the situation. After the conclusion of the staff meeting, CMT members would return to their assigned duties.

It should be noted, that the CMT isn't solely for animal escape situations, but can be utilized to respond to feral animal intrusion, human-animal interaction, special animal transport situations, natural and manmade disasters, first response to fire and medical needs, failure of critical services, and to perform

unique design and training, the CMT can also be used to coordinate preparations for an impending natural disaster, (e.g.: hurricane) or to perform routine inspections of fire and safety equipment throughout a facility. The CMT is by its very design a multi-task team.

The CMT is primarily designed for medium and large zoological institutions due to the proposed staffing that would require team members to be away from their regular duties for periodic training. However, smaller institutions could retain the CM Team Leader and the Section Leader positions to provide a crisis response without interfering with the daily work schedule.

Conclusion

The Crisis Management Team has the potential to respond to a diversity of crisis situations within a zoological institution. It is limited only by the degree of time, training, and resolve that the institution is willing to provide to support this type of program. The application possibilities are only limited by the insight and imagination of the participants.

*MSDS - Material Safety Data Sheets

Haz-Mat - Hazardous Materials

SCBA - Self-contained Breathing Apparatus

(About the Author: Since 1985 Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in wildlife management and post-graduate studies in zoology, Lab and Museum Assistant, Shoot Team Leader, ERT Member, Senior Keeper and Large Mammal Keeper at various AZA facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, and Red Cross CPR/First Aid Instructor. He is currently on research sabbatical studying crisis management and conducting the North American Crisis Management Survey.)

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Book Review

Spell of the Tiger: Man-eaters of the Sundarbans

By Sy Montgomery - 1995

Houghton Mifflin Company

215 Park Avenue South, New York, NY 10003

230 pages Hardback Price:\$22.95

*Review by Rob Denkhaus,
Curator of Education
Nashville Zoo. Nashville, TN*

I began reading Spell of the Tiger with the assumption that it would be another in the long line of books chronicling tiger attacks. With the attitude of “an eye for an eye”, the book would relate the tale of the brave hunter, using superlative tracking skills to locate and execute the offending beast. Fortunately, Spell of the Tiger is different from other books with the word man-eater in their subtitles.

Instead of describing tigers killing men or men killing tigers, Spell of the Tiger describes how people coexist with tigers in the Sundarbans. Relatively little is known about the Sundarbans tiger population except that here, in the world's most extensive remaining mangrove forest, tigers frequently hunt and kill humans. The people of the region, instead of relying upon weapons; masks worn on the back of the head; or in some cases even common sense, rely upon their faith to protect them from tiger attack. Religious ceremonies and holy men are the only protection that the people need as long as their use of the forest and its resources is pure and not contaminated by greed or misdeeds.

Author Sy Montgomery, through extensive literature searches and interviews with people of the region, has compiled the stories of Daksin Ray (pronounced Dawkin Roy), the tiger god of the Sundarbans. Daksin Ray, by taking the form of the tiger, is “the most powerful force protecting the Sundarbans’ forest - and protecting the people who depend upon its bounty.” The human population of the region believes that while the tiger protects the forest, the forest protects the tiger. This symbiotic relationship is the reason that the Sundarbans is home to the largest population of tigers in the world.

Anyone seeking life history information on tigers will be sadly disappointed in Spell of the Tiger as there is very little, and no new, information presented on tiger biology. However, if you want to delve into the relationship between man and beast, the book is a wealth of information. The book is also a pleasant reprieve from the literature that deals with various Asian culture's use of tiger parts for medicinal purposes. Instead of using the tiger for their own purposes, the people of the Sundarbans look to the tiger (and Daksin Ray) for supreme guidance and protection.

Spell of the Tiger is not light reading material. The names of the many people who were interviewed and Ms. Montgomery's liberal use of Bengali words can, at times, make for confusing reading. A simple glossary would have been helpful. The bibliography, while relatively short, is diverse and offers the opportunity to locate other sources of information on the topic.

Advice for Bowling for Rhinos Auction Chairpersons

*By Tony Nichols, BFR Volunteer
Huntington Beach, CA*



To all Bowling for Rhinos directors, "raffle chairmen", and event staff - I have learned a lesson I want to share. Don't forget to give credit to your donors. In the March 1996 issue of the *Forum*, I was incorrectly identified as the donor of the third prize to be given 1996's fundraisers. It made me sick. When I was given this object, I assumed the responsibility of properly accrediting the source and failed. The person who donated this beautiful and valuable rhino statue to BFR is Helen Brauer of Ft. Collins, CO. She did it to honor the memory of her husband Herb Brauer who was a consummate rhino-lover and a face that many a zoo's rhino keepers had seen. Herb was amiable and knowledgeable, attending conferences and contributing to conservation organizations. He would be proud of the destination of "his rhino" and Helen will be also.

I did the worst thing imaginable, getting undeserved praise. All I did was present the idea to the right person at the right time. Mrs. Brauer gave it up! There is no blame for the article's writer Patty Pearthree. I had opportunities to check the text, even speaking to Susan Chan while the feature was in production. My failure to emphasize the subject is the guilty action.

Each BFR Chapter has a person like me. We are raffle chairmen - Ha! A staff of 1 (my wife) and a few kind volunteers the night of the event. Mostly we write letters full of hyperbole to prospective donors. Our mailing list is on computer software. We have codes or categories of donors so we *know* that after three years of asking Animal Kingdom (an example), a toy store, that they will not give up a stuffed animal to please a poor, underpaid zookeeper. We know who the current and repeat donors are and treat them like family. When writing or visiting, I always give them a photocopy of the last H.O.R.N. issue published. We keep a list of what has been contributed in the past and what is sent this year. Describing the donated object in the Thank You letter is advisable. Never miss a thank you letter, and don't be late with the gratitude.

The night of the BFR event, preparation is the key. Have all your signs prepared. The price of raffle tickets should be posted in numerous places. Make a list of donors and post it. If many are local, make it prominent. If you're lucky enough to have a silent auction, place a folded placard with the donor's name printed on it next to the item. Many donors give you business cards or catalogues, use these or be sure they have a place to be picked up with a big FREE sign on it. The BFR event announcer is important to you, so write down for him/her the schedule you plan on. Give the "DJ" a list of prizes and donors too. Get them mentioned, it's your job! Especially if you see someone is present who gave or

helped collect. Oh yeah, sell many tickets along the way. Sometimes a premium for \$20 of raffle tickets works well. Be sure the items are displayed well. We hang T-shirts on cardboard forms; let people see and touch *their* prizes. Sometimes a person stares at one item for a long time, then takes out a \$20, seemingly wishing he could win IT. If you do the "first choice" method of prize selection, pay attention to the first few taken. We watch and learn, it is excellent to tell a donor his gift was chosen second. We also maintain order at the raffle table.

Afterwards the proceeds of the raffle should have a quantity in dollars - don't have this money mixed in immediately with the pledge dollars. Count it separately, it will help you judge how the effort was spent. Costs such as a 32 cent stamp for a letter, copies at a nickel apiece, and envelopes all add to your investment. It isn't selfish to want to know how your investment paid off.

And don't let up. Keep an eye out for potential donors all year long. Be creative - and *gracious*. Ouch! I can never make amends for the statement in issue No. 23, No. 2, but I hope you avoid a mistake like mine. I won't do that again. Don't be afraid to mention something twice. Also, keep good records. Many times the responsibility will shift to another person and they appreciate a legible list of donors to make their job easier. Do most of these and you can be proud that you truly contributed to the success of your BFR event. Most, importantly, I sincerely apologize to Mrs. Brauer.

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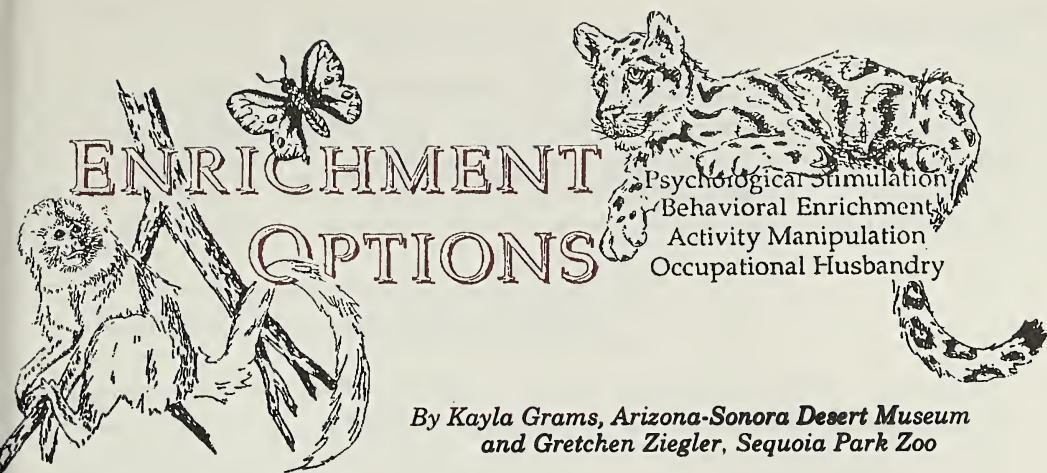
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*By Kayla Grams, Arizona-Sonora Desert Museum
and Gretchen Ziegler, Sequoia Park Zoo*

We are pleased that more explanatory drawings have accompanied idea submissions lately. Keep in mind that artistic talent is not required with these—even stick figures will do if it gets the idea across! Just be sure that the device is clearly sketched and all parts are labeled and measurements included. Then try to look at the drawing like you have never seen the device before. Could you construct it correctly using the information provided? Another excellent and interesting way to explain an enrichment device is to include a photo of an animal using it. We encourage contributors to include photos whenever possible. One more reminder: please try to include information on any products mentioned so that readers can locate these products easily if they wish. Addresses and phone numbers are helpful for keepers in different parts of the country. Thanks again, and keep those ideas rolling in.

RECYCLING AS ENRICHMENT:

The Calgary Zoo has an active recycling program, with the recycling depot being a treasure trove of no-cost enrichment items. Cardboard rolls (from toilet paper to gift wrap) provide homes for feeder mice and crickets, as well as being useful for transferring these animals during cleaning and feeding. Cardboard boxes and milk cartons are used to provide “boxed lunches” for primates. Patas monkeys love used pizza boxes, while spider monkeys will spend several hours getting into all the compartments of a liquor box. All twelve slots can have treats put in them, along with wood wool, leaves, or straw as filler. Plastic pop bottles are filled with popcorn or other dry foods. Some of our bottles have stood up to three months of bashing by our male patas monkey. He knocks them around until every item is out. Spider monkeys like plastic jugs with handles, allowing easier carrying. Toilet paper tubes with small amounts of peanut butter smeared inside are strung on cords to make mobile squirrel monkey treat feeders.

If your zoo doesn't have a recycling program, invite staff and volunteers to donate specific recyclable items. Have a storage area prepared, as you may be surprised by the amount of donations you receive.

—Laurie McGivern, Keeper
Calgary Zoo, Calgary, AB, Canada

HOOFSTOCK:

During the fall rut and almost any other time of year, our male pronghorn is very aggressive and hard to work around. One of the keepers thought of suspending a log for the pronghorn to use as a sparing bag to release some of his aggression. The pronghorn uses it quite a lot. It may be a little unsightly for some exhibits, but it is also very interesting for visitors to watch him use it.

—Kurt Simon, Carnivore Keeper
Great Plains Zoo & Museum, Sioux Falls, SD

(Editor's note: If the hanging log cannot be disguised to look natural enough on exhibit, consider hanging it in night quarters instead.)

(Ideas appearing in this column have not necessarily been tested by the editors for safety considerations. Always think ahead and use good judgement when trying new ideas. Eds.)

Husbandry Alert



The following was sent to AKF by Dianna Frisch, Columbus Zoo, and comes originally from The Federation of Zoological Gardens of Great Britain and Ireland.

"A Member zoo of this organization has brought an incident to our notice which may have far-reaching consequences. Therefore, we now bring the relevant details to your attention. On 15 March 1996, a rope in Dudley Zoo's ape house was found to be alight, causing a lot of smoke and distress to their orangutans. Fortunately the fire was discovered and put out quickly and, after dismissing any electrical fault, a fire investigation team was called in. Following several hours' work the conclusion was made that the rope had caught fire through friction.

The ropes used in Dudley Zoo's ape house are of natural fiber and are shackled in place with steel fittings. The pressure of the shackle, combined with the movement of the apes swinging on the ropes, had caused a build-up of heat in the core of the rope. On disassembling the other ropes, those which had been shackled were all found to have black cores with no visible sign externally, and it was considered to be only a question of time before they too would combust. Had this fire happened during the night, it is feared that Dudley Zoo would have lost all of their apes.

We recommend that zoos check any ropes that are shackled within indoor primate quarters and to take whatever action is necessary to avoid a repetition of this incident." —Mimi Frame, Assistant Secretary

Propagation of the American Merganser (Mergus merganser americanus) at the Baltimore Zoo

*By Susan E. Dodds
Animal Keeper II
Baltimore Zoo, Baltimore, MD*

In the Spring of 1995, the Baltimore Zoo had its most successful breeding season for the American merganser. The following is a discussion of the factors involved with our success, and the history of our group of mergansers.

The history of our group of American mergansers began in 1982 with one female merganser, and one male was obtained in 1986. In 1990 this pair produced six offspring: three DNS, two were sold, and 0.1 was kept at the zoo. In 1991 these birds, now 1.2, produced 15 offspring: 11 DNS, three were sold, and 1.0 was kept. The original female died in 1991. In 1992, with 2.1 mergansers, 11 offspring were produced: eight DNS and three were sold. The zoo obtained 1.2 mergansers to bring the group to 3.3. The original male bird (1986) died in late 1992. In 1993 and 94 no offspring were produced even though the mergansers were provided with nestboxes as in the years before.

In early 1994 we introduced 1.0 merganser to our established, but as yet unproductive, groups of 2.3 birds. Although this may seem insignificant, the extra bird provided increased stimuli during the breeding season, and we believe that it was a success factor for the 1995 breeding season.

Three different types of nestboxes were provided for the mergansers. When selecting nestboxes we had to take into consideration the African penguins (*Spheniscus demersus*) and Common eiders (*Somateria m. dresseri*) that share the same exhibit with the American mergansers. We used ten nestboxes: three merganser boxes, two square ground boxes, and three nestboxes with ramps. (See diagrams) The merganser boxes were designed specifically for use with our group of mergansers, taking into consideration that the penguins also prefer enclosed nest sites. We had problems in the past with penguins taking over nestboxes intended for ducks. These special boxes include a second entry hole that is off-set from the main entrance hole that prevents the penguins from being able to completely enter the box. The merganser boxes were first used in 1994, however, since this was an unproductive year there was no indication that the birds would not use these boxes in the future. A three-inch base of wood chips, topped with loose straw, was provided in each box as nest material.

Although the most popular box was a ground box set on concrete in the open, the mergansers used one of each of the different box types. The other types of

boxes were concealed among grasses within the exhibit. Twenty-seven eggs were laid between March 28 and May 8. The first egg laid in each box was pulled, numbered and replaced with a dummy egg (chicken egg). The eggs were then placed in a refrigerator at approximately 55°F (12.8° C) to keep the eggs in stasis until we had gathered enough to set under a broody call duck. The call ducks incubated the eggs for the first seven days, then the eggs were placed into a Petersime model #1 incubator for the duration of the 31-33 day incubation period. Most of our fertile eggs hatched after 31-36 days. Twenty eggs were fertile (74% of all eggs produced), 14 hatched (51% of all eggs produced) and the ducklings were raised in PVC brooders.

The brooders were set up as follows: 1/2 of the floor of the brooder was covered with indoor/outdoor carpet. One food pan and one water pan, with constantly running water, were placed in each brooder and each brooder was supplied with a one quart plastic waterer filled with a Baytril®/ water solution (12cc Baytril® to 1 gal. water) for the first five days. The Baytril® solution gives the ducklings a little head start on fighting possible infections. Food was sprinkled into the water pan as well as on the carpet to encourage feeding. After the first couple of days the ducklings were feeding adequately from the food pan. This was monitored by noting fecal output, or by weighing out the diets, when necessary. As with other species of ducks that we raise, the merganser ducklings were vent sexed and pinioned within the first week of life.

The ducklings' diet consisted of 33% startina, 33% chopped Mazuri® seaduck chow, 33% chopped kale, vionate, and bugs (crickets, wax worms, and meal worms). The bugs are an extra source of calcium and encourage feeding. On day 11 through day 14 duck grower was gradually added to the diet, as startina was eliminated. At this time the ducklings were moved into a larger, running water brooder, and food was scattered in the water to encourage diving behavior. On day 27 the ducklings were given the adult diet of 100% Mazuri® seaduck chow, chopped kale, and vionate. Crickets were still given as a treat. At this time, if feather growth and health were satisfactory, the ducklings were released into the outdoor rearing yards to acclimate to being outside.

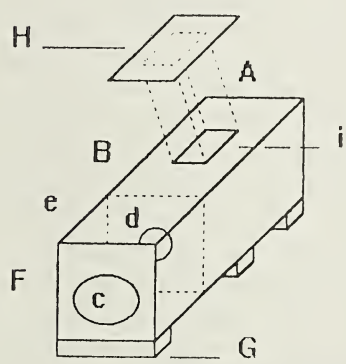
Our rearing yards are approximately 6.1m x 3m (20' by 10'), and are constructed of concrete, with netting all around and above, as well as an electric fence to help keep out potential predators. Each of our three rearing yards has two small pools with running water. When ducklings go outside for the first time, we divide the yards in half to keep the ducklings close to each other, water, and food. This also allows us to cover the whole area with carpeting or mats to help protect their feet from getting bumbles. We put several ducklings of the same species in each yard. Due to the limits of space it is sometimes necessary to intermingle species, however, this does not seem to affect the ducklings in terms of selecting appropriate mates in the future. Each area also contains a small shelter to protect the food from rain and provide the birds with shade if they want to use it. Additional shade was provided by putting stalks of bamboo on the netting over the rearing yards.

In any situation, either in natural surroundings or captive, there are always those birds that do not survive into adulthood. In 1995 we had an exceptional survival rate of 85%. Only two birds DNS shortly after being placed outside. These birds were sent off for necropsy. The necropsy report showed one bird to have severe infection throughout its entire body, and abrasions on the feet which probably were the portal of entry for the original infection. Systemic infection is probably the most prevalent cause of death in juvenile birds, and even with precautions taken, captive birds are not immune to contracting such infections. The second bird was labeled as a poor doer. This bird was found to be thin, and dehydrated, and had mild trauma to the head, probably from being pecked by more aggressive siblings.

When feather growth was complete, our 12 juvenile American mergansers were moved into an exhibit yard next to the rearing yards. The birds are now fed Mazuri® seaduck and occasionally some silverside (small fish) as a treat in the morning. We are looking forward to another productive season next year.

**DIAGRAMS OF NESTBOXES USED BY AMERICAN MERGANSERS
AT THE BALTIMORE ZOO**

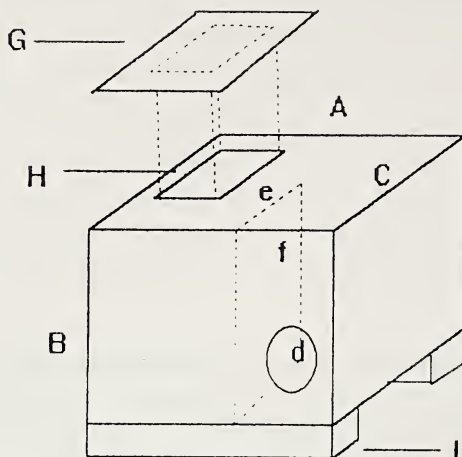
Merganser Nestbox:



- A - 30.5cm (12 in.)**
- B - 50.8cm (20 in.)**
- c - 10.2cm (4 in.) [entrance]**
- d - 8.9cm (3.5 in.)**
[entrance to nest]
- e - 17.8cm (7 in.)**
- F - 30.5cm (12 in.)**
- G - 5.1 x 5.1 x 30.5cm (2 x 2 x 12 in.)**
- H - 24.1 x 24.1cm (9.5 X 9.5in.)**
[Lid]
- i - 17.8 x 17.8cm (7 x 7 in.)**
[keeper access]

(4 eggs wre laid in this type of box)

Ground Box:



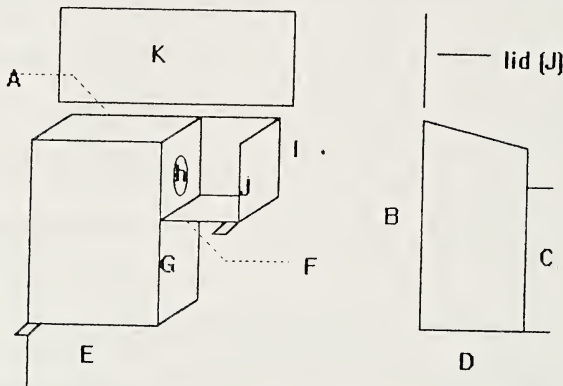
- A - 43.2cm** (17 in.)
B - 33.0cm (13 in.)
C - 50.8cm (20 in.)
d - 10.2 cm (4 in.)
[entrance]
e - 25.4 cm (10 in.)
f - 15.2cm (6 in.)
G - 24.1 x 24.1cm (9.5 x 9.5 in.)
[lid]
H - 17.8 x 17.8cm (7 x 7 in.)
[keeper access]
i - 5.1 x 5.1 x 43.2cm
(2 x 2 x 17 in.)

(16 eggs were laid in this type of box)

Upper case letters = exterior measurements

Lower case letters = interior measurements

Nestbox with Ramp (front and side view):

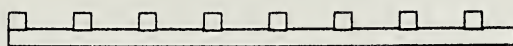


strap metal for ramp attachment (optional)

- A - 41.9cm** (16.5 in.)
B - 49.5cm (19.5 in.)
C - 44.5cm (17.5 in.)
E - 22.9cm (9 in.)
F - 19.1cm (7.5 in.)
G - 24.1cm (9.5 in.)
h - 10.2 cm or 12.7 cm (4-5 in.)
[entrance]
I - 25.4cm (10 in.)
J - 20.3cm (8 in.)
K - 30.5 x 55.9cm (12 x 22 in.) **[lid]**

(7 eggs were laid in this type of box)

We used various length of 10.2cm (4 in.) wide ramps with this type of nestbox. The length of the ramp depended on where the box was positioned. All ramps had 1.3 x 1.3cm (.5 x .5 inch) "steps" spaced approximately 7.6 cm (3 in.) apart to provide sure footing.



side view of ramp

There are a variety of ways in which a ramp can be used with this box: if the nestbox is near water, the ramp can lead from the water to the box, if the box is on land the ramp should be long enough to provide an easy-to-climb slope, as well as being positioned on solid ground. You may consider drilling holes in the ramp that are adjacent to the holes in the pieces of strap metal which are attached to the box. Tie wire can then be used for attachment. You may even have your own ideas, as long as the safety of the birds is taken into consideration first.

I would like to thank my supervisor, Steve Sarro, my fellow keepers, and our maintenance staff (who built the boxes) for contributing to the success of the mergansers, and this paper.

Manatees in Trouble?

Until recently, scientists have considered the manatee to be on the rebound from danger of extinction. However, 221 manatees have been found dead in Florida so far this year. This surpasses 207 manatee deaths in 1990, the worst year on record. Marine mammal biologists are puzzled by the deaths of 8% of the total manatee population of 2,600 animals and have not determined the cause of the mysterious deaths. "Red Tide" is suspected, but symptoms of this year's deaths do not match an epidemic of two decades ago. Experts believe that manatees could be contaminated by red tide toxins accumulated from consuming sea grasses, a major part of their diet. Dr. Gregory Bossart, chief veterinarian at the Miami Se aquarium says, "My concern, I think everyone's, is man has so compromised the health of the species already that any natural mortality in unacceptable for the health and well-being of the manatee species as a whole. It can't tolerate this scenario."

--from GREENlines Issue #99

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Zoonotic Diseases, 2nd edition - 40-page reference work details the most common zoonotic diseases, offers guidelines for preventive control and covers personal hygiene and disinfection procedures. Information for each disease is presented in a text format and includes ethiologic agent, means of transmission to man, global distribution, alternate or intermediate hosts, human incubation and human symptoms. Cost is \$8.00 for AAZK members; \$12.00 for Nonmembers. Price includes domestic shipping; orders outside U. S. and Canada should add \$3.00 per copy for air mail.

HALF PRICE - Zoo and Aquarium Professionals: The History of AAZK - 216-page volume chronicles the history of the American Association of zoo Keepers, Inc. from its beginnings in San Diego in 1967. Includes early evolution of the Association, its projects, programs, committees, the histories of its 70+ Chapters and its involvement in the highly successful program "Bowling for Rhinos". Cost is \$5.00 for AAZK members; \$7.50 for Nonmembers. Orders outside U.S. should add \$3.00 per copy for postage.

"What Kind of Animal Are You?" - 40-page collection of zoo keepers' favorite anecdotes about their work, the animals, and the visitors. Produced by the Brookfield Zoo Chapter and edited by John Stoddard. LIMITED NUMBER AVAILABLE. Cost is \$5.00 for AAZK members; \$8.00 for Nonmembers. Non-domestic orders add \$3.00 for shipping.

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Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks / AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.

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ANIMAL KEEPER III...Elephant area. Minimum AAS degree, BA/BS preferred. Experience with free contact management system required. Currently house three Asian cows. Copy of Elephant Protocol and job description available to serious candidates. Starting date range: 1 August - 1 September 1996. Salary \$21,119.00 to \$23,459.00, 12 paid holidays, vacation, fully-paid health, life insurance and dental plans, pension plan, uniforms provided. Resumé and references to: Gerald D. Aquilina, General Curator, Buffalo Zoological Gardens, 300 Parkside Avenue, Buffalo, NY 14214.

ANIMAL KEEPER...Elephant/Ungulate department. Prefer three years experience in the husbandry/handling of elephants. Will work with 2.3 African elephants free contact. Salary \$11.52 to \$12.72 per hour depending on experience plus a comprehensive non-contributory benefit package including health, dental, vision, short and long-term disability, insurance, life insurance, paid vacation and personal time. Please send resumé and cover letter to: Donna Anderson, HR Manager, Pittsburgh Zoo, One Hill Rd., Pittsburgh, PA 15206.

ZOOKEEPER - Psittacines...requires minimum of one year paid, hands-on experience with Macaws and degree or equivalent zoo-related experience. **Mammals** - requires minimum of one year paid, hands-on experience with ungulates and felines and degree or equivalent zoo-related experience. Duties for both positions include daily care, feeding, habitat upkeep, breeding programs, record-keeping, medical coordination, training, acquisitions, supervising part-time staff/volunteers, and presenting educational programs, etc. Must be willing to work weekends/holidays. Starting salary \$15,000.00 - \$20,000.00 with year-end bonus and benefits. Excellent growth potential. Salary commensurate with experience. Send resumé/ references to: Cougar Mountain Zoological Park, 19525 SE 54th, Issaquah, WA 98027. Fax (206) 392-1076. Positions open until filled.

INTERNSHIP...the Miami Valley Serpentarium, a nonprofit organization, is seeking student interns for the 1996 fall season. MVS is an educational exhibit, reptile breeding and venom research facility located near Kentucky's Red River Gorge and Natural Bridge State Park. The intern will assist in the captive maintenance of the zoo's reptile collection, collect admissions in the exhibit, give interpretive talks and interact with the public, assist with educational outreach programs, and perform other duties as assigned. In addition the intern will be responsible for the completion of at least one research project related to the field of herpetology. The intern **will not be involved** in the handling of any venomous reptiles. Desirable qualifications include a willingness to handle snakes and other reptiles on a daily

basis, ability to communicate effectively with people, good writing skills, orientation to details, and self-motivation. Students majoring in the biological or natural sciences are preferred. Former interns have arranged for academic credit with their colleges or universities. Salary and benefits include experience with the most extensive and diverse collection of snakes in the area, housing, and \$55/week in pay. Personal transportation is recommended. Starting dates are flexible, but a minimum commitment of three months covering September-November is required. To apply send cover letter and resumé to: James R. Harrison, Executive Director, MVS Reptile Zoo, 1275 Natural Bridge Rd., Slade, KY 40376. **Deadline** for Fall applications is **15 June 1996**.

KEEPER...requires a degree and one year of experience with captive exotic animals. Two or more years of experience may substitute for the degree. Responsibilities include all aspects of daily animal care, routine exhibit maintenance and public education. Two positions are available: Bird Keeper and Open Relief Keeper. To apply send cover letter and resumé to: Human Resources, The Philadelphia Zoo, 3400 West Girard Ave., Philadelphia, PA 19104.

REPTILE/BIRD KEEPER...one year paid zoo experience required in these areas. Applicant will be responsible for the care of animals and also public presentations. Send resumé to: Vince Hall, Claws 'N' Paws Wild Animal Park, RD 6, Lake Ariel, PA 18436.

Information Please

I am seeking enrichment ideas on the following handleble reptiles: ball pythons, rat snake, milksnake, box turtles, blue-tongue skinks, tiger salamander, and White's tree frog. Please send any information to: Maria Browning, CZ Keeper, San Antonio Zoo, Children's Zoo, 3903 N. St. Mary's St., San Antonio, TX 78212.

Can anyone provide me with information on keeping sloths? Unfortunately, the new fashion of pets arrived in Barcelona and many exotic species of mammals are confiscated in the last years. One of these species is the edentata (*Bradypus* sp.). It is very difficult to keep the babies of sloths and we don't have any information and experience about keeping these animals. I hope to receive any information (husbandry, diet, hand-rearing, etc.) that can help the next animal that will arrive in our hands.

Also, I have started writing a manual on keeping and breeding poison arrow frogs (Fam. dendrobatidae) for a future project in collaboration with the Columbia zoos. If anyone would like to exchange information/experiences with me and/or collaborate in writing this manual, I would be interested to hear from you. Please send information on either of the above requests to: Gerardo Garcia Herrero, Parc Zoológic de Barcelona, Parc de la Ciutadella s/n. Barcelona 08003. Spain. Fax: 2213853; e-mail: jordis@trivium.gh.ub.es.

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Mail this application to: AAZK Administrative Offices, Topeka Zoo, 635 S. W. Gage Blvd., Topeka, KS 66606-2066. Make checks/money orders payable to AAZK, Inc. Must be in U.S. FUNDS ONLY. Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

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ANIMAL KEEPERS' FORUM



The Journal of the American
Association of Zoo Keepers, Inc.

JUNE 1996

ANIMAL KEEPERS' FORUM, 635 S.W. Gage Blvd., Topeka, KS 66606-2066

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June 1996

Vol. 23, No. 6

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AAZK PUBLICATIONS - CONTINUING DATA COLLECTION

Zoo Infant Development Project - Teri Maas-Anger/Maggie Liguori, Philadelphia Zoo (Birds/Nonpasserines); Jennifer

Hackshaw, Lowry Park Zoo and Suzanne Chacon, Costa Rica (Birds/passerines); Jeanne Stevens, Newark Museum

Mini-Zoo (Reptiles); Linelle Lone, Denver Zoo (Amphibians)

Diet Notebook, Mammals, Vol. II - Susan Bunn Spencer, Rockford, MI

Incubation Notebook Project - Scott Tidmus, Sedgewick County Zoo, Wichita, KS

Exhibit Design Resource Notebook - Mike Demlong, The Phoenix Zoo, Phoenix, AZ



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About the Cover.....

This month's cover features the Central American Spider Monkey (*Ateles geoffroyi*) drawn by Roby Elsner, a primate Keeper at the Dallas Zoo, Dallas, TX. These agile primates live in small bands in the rain forests of Central America. They like high tree branches and are rarely seen on the ground. They find their food, chiefly fruits and leaves, high in the trees. They also sleep in groups of two or three, supporting each other with their long prehensile tails. They use their arms, legs and tails when traveling across the forest canopy and truly resemble a spider running on its web. Young are born throughout the year after a gestation of 139 days with a single young most common. They have no thumbs, their fingers are joined by a small palm. They average 22lbs in weight with a body length of about 20 inches, plus 30 inches of tail. Thanks, Roby!

Information for Contributors

Animal Keepers' Forum publishes original papers and news items of interest to the animal keeping profession. Non-members are welcome to submit articles for consideration. Articles should be typed or hand-printed and double-spaced. Articles may be submitted on disk by arrangement with the Editor. All illustrations, graphs, charts and tables should be clearly marked, in final form and should fit in a page size **no greater than** 5.5" x 8.5" (14cm x 22cm). Literature used should be cited in the text (Brown, 1986) and alphabetically in the final bibliography. Avoid footnotes. Include scientific name (as per ISIS) the first time an animal name is used. Thereafter use common name. Use metric system for weights and measurements (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs. etc.). Glossy finish black and white photos **only are accepted**. Color slides should be converted to black and white prints (minimum size 3" x 5" [8cm x 14cm]) before submission. Clearly marked captions should accompany photos. Please list photo credit on back of photo.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the editor. The editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone and FAX contributions of late-breaking news or last-minute insertions are accepted as space allows. However, long articles must be sent by U.S. mail. Phone 1-800-242-4519 (US); 1-800-468-1966 (Canada); FAX (913) 273-1980.

Deadline for each regular issue is the 10th of the preceding month.

**Dedicated issues may have separate deadline dates
and will be noted by the editor.**

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by AAZK, Inc.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the editor. Reprints of material appearing in this journal may be ordered from the editor. Back issues are available for \$3.00 each.

Scoops & Scuttlebutt



From the President - New Board Member Appointed

Michael Illig, keeper at the Metro Washington Park Zoo in Portland, OR, has been appointed to an interim position on the Board of Directors of the American Association of Zoo Keepers, Inc. Michael will serve an 18-month term and have the opportunity to run for a four-year term in the next BOD election scheduled for 1997. This appointment was necessary due to the recent vacancy left by the resignation of Alan Baker, formerly of the Burnet Park Zoo, Syracuse, NY, who has accepted a management position at the Sacramento Zoo, Sacramento, CA. Members of the AAZK, Inc. Board of Directors must be full-time keepers and Professional members of the Association. We welcome Michael to the Board and look forward to working with him in the coming months.

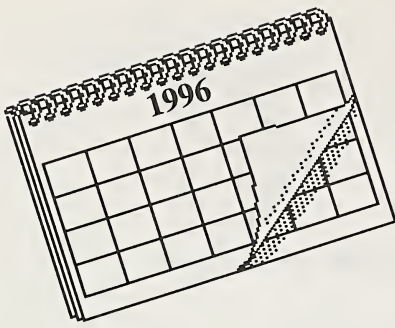
Donation Aids Project M. A. R. C.

A \$500.00 donation from Pat Arnold of Takoma Park, MD has been given to assist in the administration of Project M. A. R. C. (Making A Realistic Contribution). The project, which sends educational materials to zoo staff at zoos around the globe, is under the direction of AAZK member Kathy Kelly, National Zoological Park in Washington, DC. This donation will help pay the postage expenses for sending these much-needed materials which assist zoo staff members in learning more modern techniques for captive animal care. We also wish to offer our congratulations to Kathy on her receipt of a J. C. Penney Golden Rule Award for her volunteer research work on flying squirrels at a nature center in her area. Anyone interested in more information about Project M. A. R. C. or who would like to help out may contact Kathy c/o the Pathology Dept. at the National Zoo.

ADT Forms Available Upon Request

Animal Data Transfer Forms for zoos and aquariums are available free of charge upon request. This is a professional service provided by AAZK, Inc. Contact: Bernie Feldman, Burnet Park Zoo, One Conservation Place, Syracuse, NY 13204. If your facility is not already using the ADT Form, please encourage your administration to implement its use whenever an animal is shipped.

◆ Remember that the deadline for the
AAZK Membership Contest is July 1, 1996 ◆



Coming Events

1996 Central Regional Volunteer Conference - August 2-3, 1996 at Sioux Falls, SD. Hosted by The Great Plains Zoo and Delbridge Museum. For information contact: Jackie Goosen or Vanessa Lambert at (605) 367-7003 or fax (605) 367-8340.

Animal Behavior Society 33rd Annual Meeting - August 3-8, 1996 at Northern Arizona University, Flagstaff, AZ. There will be a pre-meeting symposium July 31-August 2: *A Synthetic Approach to Studying Animal Cognition: Examples from Specialized Domains*. For information contact: Dr. Con Slobodchikoff, Dept. of Biological Sciences, Northern Arizona University, Flagstaff, AZ 86011; email: Con.Slobodchikoff@nau.edu. For symposium information contact Dr. Russ Balda - email:Russell.Balda@nau.edu.

American Federation of Aviculture 22nd Annual Convention - August 7-10, 1996 in San Francisco, CA. Focus will be on Asian and Indonesian birds, with a special program on finches and softbills. Conference will feature many guest speakers, local tours of SF area and Marine World/Africa USA. For further information contact the AFA Business Office at (602) 484-0931.

Association of Avian Veterinarians 1996 Conference - August 27- September 1, 1996 in Tampa, FL. Meeting includes sessions on medicine, diagnostics, ratites, infectious diseases, environmental practice, etc. Also included will be practical application labs on surgical topics, parasitology, avicultural medicine. For more information contact the AAV Conference Office at (303) 756-8380.

ZOOMANIA - 96 - Southeast Regional Docent Conference - September 13-15, 1996 at Gulf Breeze, FL. Registration and hotel information available by contacting the Docent Council or Curator of Education at THE ZOO (904) 932-2229, ext. 27.

Association of Zoological Horticulture International Conference - October 4-12, 1996 in Greensboro, NC. For further information contact: Corinne Benbow, North Carolina Zoological Park, 4401 Zoo Pkwy., Asheboro, NC 27203.

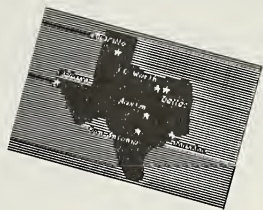
23rd Annual National AAZK Conference - October 5 -10, 1996 in Detroit, MI. Hosted by the Detroit AAZK Chapter and the Detroit Zoo. Watch AKF for information/forms.

Association of Zoo Veterinary Technicians 16th Annual Conference - October 29 - November 1, 1996 in Puerto Vallarta, Mexico. Will include sessions on reptile, avian, primate, exotic hoofstock and aquatic medicine, immobilization, hematology, clinical pathology, hospital techniques and case reports. There will also be a wet-lab. For more information contact: Jenni Jenkins, LVT, National Aquarium at Baltimore (410) 659-4256; fax (410) 576-1080. For membership information contact Lisa Kolbach, LVT at White Oak Conservation Center at (904) 225-3396.

TIME IS RUNNING OUT !

This is your LAST CHANCE

to win that trip to Houston!



Summer is drawing ever near and the end of the AAZK Membership Drive is even closer! Let's all get motivated and help make this campaign a success!

This is the first year we have had a membership drive and we all remain optimistic about its outcome. However, not many people have been taking advantage of the chance to win some great prizes!

Currently our organization is 2,660 members strong. Last count for the new members joining under the membership drive was 98. That certainly is not a very high percentage—we know we can all do better.

There is still time for us to boost our numbers if every member of AAZK, Inc. solicits at least one new person! Remember that this drive is the alternative to having to raise individual membership dues. This is a win win situation for all of us if we just get involved.

The official deadline for the contest is **July 1, 1996**. The grand prize for the individual who solicits the most new members is a trip to the National AAZK Conference in Houston, TX in 1997. The top Chapter will win its choice of a great publication and the top five Chapters will have their recharter fees waived for 1996.

Everyone always asks what this organization can do for them. What is it that you want this organization to do? Each person has different expectations and goals. A part of AAZK, Inc.'s mission is to promote professionalism in zoo keeping and to provide the avenues and resources to achieve this goal. These "basic" needs are provided to the membership through the *Animal Keepers' Forum*, conferences, reference and training manuals, local Chapters, and the numerous committees that form the roots of this organization.

The next time someone asks "What will AAZK do for me?" one should simply respond "AAZK can only provide as much as you are willing to get out of it. Everything depends upon what you're looking for and what your level of involvement is."

Do yourself a favor and become involved in this membership drive and in this organization **TODAY !**

AKF Survey Analysis - Part 2

Comments Section

By Gretchen Ziegler, Associate Editor
Sequoia Park Zoo, Eureka, CA



Printed in the March 1996 issue of *AKF* were the numerical tallies of the survey we distributed at the Denver conference and published in the *Forum* last fall. Here now is the editorial staff's response to the meatier part of the survey - the comments, suggestions and criticisms. Each of us read and re-read each survey and discussed the comments in detail. The following is a description of the publishing process which we hope will provide readers with a clearer understanding of how and why we do things, and then we will attempt to address most of your comments.

Month in and month out, AAZK members around the globe receive their eagerly awaited *AKFs* (albeit sometimes closer to month *out* rather than month *in*), perhaps without realizing that 99.9% of the work involved is done by one person, Managing Editor Susan Chan. (The Associate Editors will claim .1% of the credit whether or not we deserve it...). What was a 16-page publication 15 years ago when Susan came on board is now a 48-52-page one. Susan is technically considered a part-time employee working about six hours a day (more with the approach of deadline), racing the clock each month in a cycle that goes something like this: Week 1 of each month - on the heels of the mailing of the *AKF* near the end of the previous month, Susan spends the first few days of each month catching up on correspondence, preparing manuscripts to go out to reviewers and following up advertising leads. Week 2 begins the countdown to the 10th of the month deadline - manuscripts are entered into the computer, photographs are scaled and processed, ads are "blocked" into the upcoming month's issue. Because not everyone is always good about sticking to the 10th of the month deadline, this can be a very hectic time as she awaits last minute insertions of Chapter News, B&H, job listings, etc. Week 3 is spent pulling all of the material into PageMaker (the desktop publishing program we use), formatting the pages, determining cover art selection, putting in last minute items (like the job listings page(s) which is done last so that we may include as many listings as possible). Finally, the Table of Contents is done. The *AKF* is then taken to the commercial printer (100% camera ready, except for photo negative insertions) no later than the 22nd of each month. Turn-around time at the printer's is about five work days and the *Forum* is usually mailed around the 26th to 28th of each month. Once the mailing is accomplished, advertising invoices are sent out, complimentary copies to authors and artists are mailed and work continues on upcoming special issues, other AAZK publications needing editing and/or revision, etc.

Then breathe a sigh of relief and start the whole process over again tomorrow.

This schedule is tight at best and leaves little or no room for extras such as soliciting or researching articles, which puts the contents of *AKF* almost completely in the hands of you, the reader. In other words, we don't generate articles internally - we print what you submit. A majority of the comments received on the surveys requested more articles on specific subjects (herps, hoofstock, enrichment, etc.) We'd love to print them, just as soon as we get them! So if you have a particular interest that you want to see written about, start the ball rolling by writing one on the subject yourself. Remember, articles do not have to be about raging successes; frustrations, problems or disasters are all valuable to share with your peers. And while we do have a few guidelines for submission, we can and are very willing to rewrite your article if needed and we also welcome short information pieces if you hesitate to call your contribution an "article". The bottom line is that you have valuable information which will benefit your peers, profession and journal. Make a commitment to share your expertise.

Not only is the *Forum* limited by staffing and time constraints, but by (surprise!) financial ones as well. In the last six months, printing costs alone have run anywhere from \$2123.00 to \$3349.00 per month depending on the number of pages, photos, color inserts, etc. Even though non-profit bulk mail rates are used, mailing costs run around \$460.00 a month (domestic copies only, an additional \$200 for Canadian and overseas). Because we use the nonprofit bulk rate, this means that your *AKF* may be held for up to three days at each postal sub-station it passes through between you and Topeka if that sub-station is tied up with priority mail. This explains why many of you may not receive your *AKF* as soon as you'd like. We realize this is frustrating, especially when you are wanting to respond to date-sensitive job listings. We do inform institutions submitting job listings of this potential for delay and encourage them to be realistic with their closing dates. However, once the *Forum* leaves our office, we really have no control over how fast it moves through the postal system. It is a financial necessity to use this postal rate because to mail an average *AKF* within the U.S. at first class rates would run \$1.01 per copy which would have to be tacked on to the price of your membership dues to make ends meet. If a member wishes to receive their *AKF* via first class mail, they may do so by paying an additional \$15 for postage and handling to Barbara Manspeaker at Administrative Offices.

With the increasing cost of publishing *AKF*, it is getting more difficult to publish a quality product without resorting to the dreaded Membership Fee increase. In an effort to keep your dues as low as possible, the Board decided to pursue advertisements in the *Forum*. The Marketing Resources committee was born and these folks have worked hard to bring in more advertisers. The last six months have seen a substantial increase in ad revenue - by the March 1996 issue, 34% of the *Forums* cost was being met by advertising revenue, putting us closer to our goal of 50% each month. We know all our members will smile to see new ads throughout the text of the journal as it ultimately means less money out of your pocket!

Survey response was quite positive regarding the recent format changes undertaken, such as larger size and print, etc. These changes were made to upgrade the professional look of the journal and to improve its readability, as well as to make it more appealing to potential advertisers (which in turn makes it more cost effective). The added flexibility for formatting improvements makes the whole journal more pleasant to read. We are happy most of you like the change (and we regret any hardships in having to redesign bookshelf space - everything has a price). A few surveys mentioned that the larger size was being damaged in the mailing process. If this occurs, please let us know.

Some respondents expressed a concern for the lack of information about the Association and its activities. To address this, we will be requesting an update from all committee/project chairs to publish in the *AKF*, and will also possibly include some information on the LINK system from time to time for those members who are not part of an AAZK Chapter. LINK newsletters are mailed quarterly to Chapters but are also available to individuals upon request. Members can also request copies of the mid-year Board meeting minutes by writing AO. These are fairly lengthy and would take away too much space from other articles if published in the *AKF* each year.

Most responses were in favor of keeping the Births & Hatchings column, although there were several suggestions for its improvement. We have decided (after this issue) to temporarily discontinue the column for a few months while we reevaluate and experiment with new formatting. Stay tuned for the new improved Births & Hatchings!

Response was also overwhelming positive towards the Legislative Update column. Some folks requested more international (especially Canadian) bulletins, and Georgann Johnston, Legislative Advisor, is making an effort to find more such information to include. Readers should be seeing more international updates in the future. These legislative updates are meant to keep you informed on current legal and political issues pertaining to our profession. As a 501(c)(3) non-profit association, AAZK cannot legally take official positions on issues without jeopardizing our exempt status. We can only provide members with the information so that they may take action individually as they see fit.

Some members expressed a wish to see more controversial topics discussed and debated in the Viewpoint column. We do encourage readers to use Viewpoint to initiate thoughtful and professional dialog about issues important to captive animal management. To ensure professional standards, Viewpoint submissions are published at the discretion of the Editor and the Executive Director of AAZK, Inc. AAZK, Inc. is not a union and the *AKF* cannot be used as a forum to air problems between keepers and management.

In the past, the *AKF* has published humorous cartoons, anecdotes and poems from our more literary-creative colleagues, and some readers have wondered if we could add some humor back into the *AKF*. The editorial staff debates this

each time the subject comes up, because we do recognize the value of an occasional joke or funny story here and there, and frankly some of us miss the old days when things weren't always so serious. However, we think most members would agree that our Association has worked long and hard to develop high standards of professionalism and our journal plays a key role in this goal. With this in mind, we are hesitant to add much whimsy to the *Forum*, although if someone presented us with an interesting idea, we would certainly consider using it in some capacity.

We had a few suggestions to provide more information about SSPs, TAGs, FIGs, and other acronyms of the business, which we accomplished in part in our special issue on SSPs earlier this year. We feel that most of these subjects are best covered in the *AZA Communiqué*, which most keepers should have access to, so at this point we would prefer not to duplicate the effort.

Finally, we had several requests to include information on Internet sites and addresses which pertain to the profession. If you know of a site which might be appropriate, let us know in case we haven't caught wind of it yet and Susan will publish these addresses as they become available. As for the suggestion of creating our own Web site, we don't quite have the resources at this point to take that technological leap, although it is an intriguing idea. We're still trying to cope with upgraded computer programs and e-mail—it may be awhile before we're ready for an Internet site!

In the arena of technology, however, we would like to encourage authors to submit their manuscripts on disk either in Microsoft Word or WordPerfect. We also have translators for some other IBM-compatible programs, but it is best to check with Susan before sending in a form not listed above. We also request that authors send along a "hard" copy with the disk.

That about wraps up our commentary on the surveys. If we didn't directly address your particular comment or suggestion, don't despair. We did discuss every comment offered, and tried to address the most practical ones. Some of your suggestions gave us ideas that we will be incorporating into future issues. As for some of the...well, less realistic ideas...we still appreciate them and we're always willing to listen to them again. Your comments, complaints and suggestions are always valued at any time. A hearty thank-you to everyone who took the time to send in a survey. You have truly helped shape the look of your *Animal Keepers' Forum*.



Births & Hatchings



Lincoln Park Zoo (Chicago, IL)...announces the following B&H for January 1995 through December 1995:

Mammals - 1.0 Bornean orangutan (*Pongo pygmaeus*) [E/SSP, CITES I]; 2.0.1 black howler (*Alouatta caraya*) [0.0.1 DNS - CITES I/T]; 0.1.1 pygmy marmoset (*Callithrix pygmaea*) [0.0.1 DNS - CITES II]; 1.0 grey titi (*Callicebus moloch donacophilus*) [T]; 0.1 Grevy's zebra (*Equus grevyu*) [T/SSP, CITES II]; 0.1 Grant's gazelle (*Gazella granti*); 1.0 La Plata three-banded armadillo (*Tolyteutes matacus*).

Birds - 0.0.1 Jambu fruit dove (*Ptilinopus jambu*) {DNS - 1st for pair}; 0.0.3 yellow-throated laughing thrush (*Garrulax galbanus*) [U]; 9.3.2 piping plover (*Charadrius melodus circumcinotus*) 3.0.2 DNS - E; 0.0.2 crimson backed tanager (*Ramphocelus dimidiatus*) [DNS - U] 0.2 Micronesian kingfisher (*Halcyon cinnamomina*) [0.1 DNS - E/SSP].

Reptiles - 0.0.3 African pancake tortoise (*Malacochersus*). submitted by Mike Skidmore, Lincoln Park Zoo AAZK Chapter Liaison.

Denver Zoo (Denver, CO)...announces the following B&H from October through December 1995:

Mammals - 1.0 scimitar-horned oryx (*oryx dammah*) [CITES I/SSP]; 0.1.0 yellow-backed duiker (*Cephalophus sylvicultor*) [CITES II]; 0.0.1 Grevy's zebra (*Equus grevyi*) [0.0.1 DNS - CITES I/T/SSP]; 1.0.1 pygmy marmoset (*Callithrix pygmaea*) [1.0.0 DNS - CITES II]; 1.1 lesser kudu (*Tragelaphus imberbis*); 1.0 red kangaroo (*Megaleia rufa*) [T]; 3.2.0 Addra gazelle (*Gazella dama ruficollis*) [CITES II]; 1.1.0 polar bear (*Ursus maritimus*) [DNS - CITES II]; 0.1.0 colobus monkey (*Colobus guereza kikuyuensis*) [CITES II]; 0.0.2 golden lion tamarin (*Leontopithecus rosalia rosalia*) [CITES I /E/SSP].

Birds - 0.0.2 crested screamer (*Chauna torquata*) [0.0.1 DNS]; 0..0.1 Lady Ross' plaintain-eater (*Musophaga rossae*) [DNS]; 0.0.1 Nicobar pigeon (*Caloenas nicobarica*) [CITES I]; 0.0.7 blue-crowned hanging parrot (*Loriculus galgulus*) [DNS - CITES II].

Reptiles - 0.0.3 flat-tailed day gecko (*Phelsuma laticauda*) [CITES II]; 0.0.1 Fiji Island iguana (*Brachylophus unk. sp.*) [DNS - CITES I/E]; 2.0.4 emerald tree boa (*Corallus caninus*) [0.0.4 DNS - CITES II]; 0.0.2 Madagascar day gecko (*Phelsuma dubia*) [0.0.1 DNS - CITES II]. submitted by Vicki Sawyer, Rocky Mountain AAZK Chapter Liaison.

Birmingham Zoo (Birmingham, AL)...reports the following significant B&H from January through 8 April 1996:

Mammals - 0.0.2 pygmy marmoset (*Callithrix pygmaea*) [DNS - CITES II]; 0.0.2 golden spider monkey (*Ateles geoffroyi vellerosus*); 0.0.1 Hoffman's sloth (*Choloepus didactylus*); 1.0 reticulated giraffe (*Giraffa camelopardalis reticulata*) ; 0.1.0 greater kudu (*Tragelophus strepsiceros*) [DNS]; 0.0.3 capybara (*Hydrochaerus hydrochaeris*); 0.2.0 llama (*Llama glama*).

Birds - 0.0.1 sun bittern (*Botaurus lentiginosus*); 0.0.4 Australian black swan (*Cygnus atratus*); 0.0.4 black-necked swan (*Cygnus melabocoryphus*); 0.0.26 emu (*Dromiceius novaehollandiae*).

Reptiles - 0.0.34 common boa (*Boa constrictor*) [born to two different females]; 0.0.1 Florida pine snake (*Pituophis melanoleucus mugitus*); and 0.0.1 black pine snake (*Pituophis melanoleucus lodingi*).

Since January of 1995 the Birmingham Zoo has experienced exciting success in hatching the following reptiles: 0.0.1 Dumeril's monitor (*Varanus dumerli*); 0.0.11 beaded lizard (*Hleoderma horridum*) [0.0.1 DNS]; 0.0.3 panther chameleon (*Chamaeleo pardalis*) [0.0.2 DNS]; 0.0.3 pancake tortoise (*Malacochersus tornieri*); and 0.0.5 African mud turtle (*Kinosternon sp.*). *submitted by Greg Bockheim, AAZK Chapter Liaison / Relief zookeeper, Birmingham Zoo.*

Births & Hatching Code:

E - endangered	T - threatened	U - unusual in captivity
SSP - covered by SSP	CITES - included on one of the indices of the Convention on International Trade in Endangered Species of Flora & Fauna	
DNS - did not survive		

Notice to B&H Submitters: The Editorial Staff is reevaluating the Births & Hatchings column in light of the *AKF* survey results and some of the comments and suggestions concerning the column. You may continue to submit information, but it may be several months before the column appears again. If you do wish to send in listings, **be sure to include scientific names** and codes as listed above where applicable. Thank you for your cooperation.

Animal Behavior Concerns & Solutions

A Question and Answer Forum for the Zoo Professional

By Diana Guerrero

Independent Behavior Consultant, Ark Animals of California, San Diego, CA

There has been a great interest in this column and the strategies or viewpoints presented. In order to facilitate the most accurate assistance here are some tips for those who wish to submit questions.

In lieu of on-site visitations I find that video tapes are the most valuable tool in providing a fairly accurate assessment.

1. Please include as much background on the animals and exhibit as possible. This may include age, sex, ratio in exhibit, health problems (past & present), how long the animal has been housed at the institution, any personal notes or descriptions including "gut feelings."

2. Please delineate the problem as clearly as possible. Important notes should be how long the behavior/problem has been occurring, what conditions surround it, if it is specific to certain individuals (animal or human), when it first occurred and theories as to why.

3. VHS video submittal. Please include footage of normal routine or behaviors and of the problem/behavior concern.

Footage should show as much of the animal and immediate surroundings as possible. If it is a multiple species habitat it is important to include wide angle shots for notations on group interactions.

In training scenarios leave the audio on and include both the trainer and animal in the shot. Please focus on avoiding having the trainer's back blocking the animal.

Shade areas could appear dark. For proper assessment of body tension, postures, and expressions it is important to try and catch the animal as clearly as possible and as much of the animal that will fit in the frame.

4. Photographs or diagrams may sometimes be helpful.

5. Please leave both a daytime and evening phone number with the area code for additional questions if they arise.

Look forward to more of your questions! You may submit questions for this column to the AAZK Office, 635 S. W. Gage Blvd., Topeka, KS 66606-2066. You may contact Diana directly at 1-800-818-7387 or visit her Home Page at <http://www.ni.net/brookhouse.com>.



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Successful Introduction of 2.0 North American River Otters (*Lutra canadensis*)

*By Jan Outlaw, Zoo Keeper
Miller Park Zoo, Bloomington, IL*

This paper will describe the exhibit and introduction procedures for 2.0 North American river otters (*Lutra canadensis*) at Miller Park Zoo.

Miller Park Zoo has exhibited river otters since September 1974. The current exhibit is approximately 150 sq. meters (1600 sq. ft.) of space including an upper and lower pool with a short waterfall, two hollow logs, and several other logs, trees, grass, and shrubs. The exhibit is moat-like and surrounded by a 1 1/2 meter (5 ft.) concrete wall.

Over a span of five years we have had three female otters on exhibit with our present eight year-old male, Sharky. Due to a variety of health problems, our females have not survived and/or reproduced as we had hoped. Sharky had been exhibited alone for a total time of 19 months throughout the five years, the most recent totaling 11 months. We were continuously searching for a replacement female and having no luck as we began to consider other possibilities.

Throughout Sharky's residence at Miller Park Zoo he has had a recurring circling behavior, always to the right. This behavior sometimes resulted in a worn circle or race track at the front or side of the exhibit. We considered several possible reasons for his behavior: it could have developed due to leg injuries that brought him to captivity; it could be boredom/stress related; or it could be due to a brain parasite. The last possibility has been ruled out.

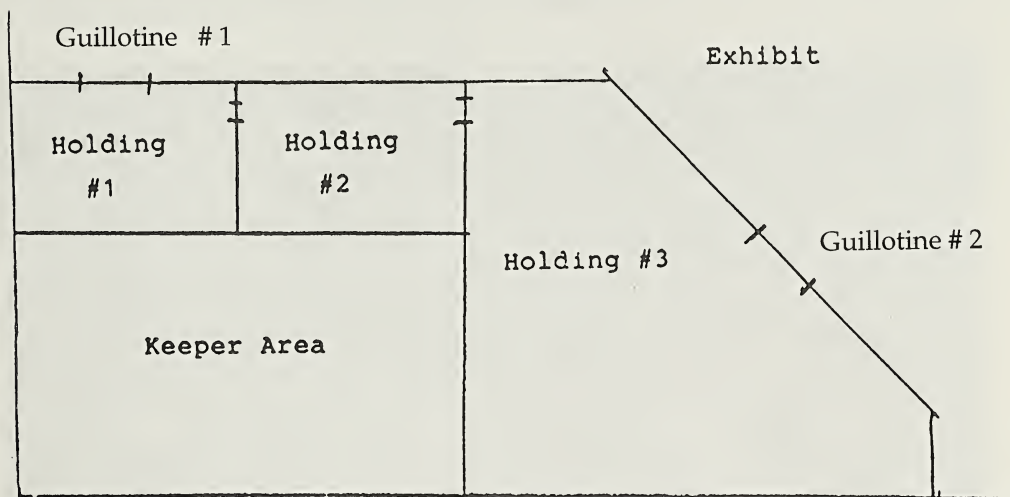
Due to the circling behavior, Sharky's need for social stimulus, and overall lack of exhibit activity, the decision was made to find further companionship for Sharky. Reproduction would be an added benefit, but was not a primary goal.

Our possibilities would be to accept a pair of otters, or we could accept a single male, to go with Sharky. Either way we felt we needed to consider territoriality (Rock, 1994) and the basic social structure of river otters (Polechla, 1990). With our limited denning area and exhibit size we decided that our best choice would be to accept another male. Therefore, when a young male river otter became available the decision was made to see how two male otters would relate in our exhibit.

Sharky, an estimated eight year-old, wild-caught river otter from Florida, has been on exhibit for 7 1/2 years. Louie is an estimated one and one half-year-old, wild-caught male from Louisiana. Louie arrived on 16 February 1995 and was in quarantine for seven weeks due to the possibility of his having heartworm.

Tests were repeated and found him to be free of heartworm so the introduction was begun on 10 April 1995.

The holding area for the otter exhibit is quite small, measuring approximately 4 1/2 sq. meters (20 sq. ft.). There are three sections to the holding area with guillotine doors at the two ends.



On the afternoon of 10 April 1995, Louie was put in Holding #2 and #3 of the otter den with Sharky having access to Holding #1 through the guillotine door #1. The otters could view each other and touch through the 2" x2" metal mesh of the holding areas. At 1030 hrs. the next morning, 11 April, Sharky was shut in Holding #1. Since Louie was very cautious, staying in the dens, he was shut out of the holding areas #2 and #3 where he stayed all night. While on exhibit, Louie inspected the exhibit, swam, and then slept in one hollow log. The following morning, 12 April, Louie was shut in Holding #1 and Sharky was let on exhibit. Louie was then shifted to Holding #2 and #3. There were no signs of aggression between the two, no vocalizations or attacking of the wire- only general curiosity by both. This rotation continued smoothly, due to otter curiosity, until 18 April. At 0930 hrs. on 18 April, both otters were given access to the exhibit through opposite guillotine doors which were then closed. At 1800 hrs. each day they were given access to the dens for the night.

Sharky and Louie immediately started nudging and nosing each other for approximately five minutes. Both entered one hollow log resulting in a rolling fight of about ten seconds with Sharky escaping into the lower pool. They proceeded to avoid each other for approximately five minutes and then fought for twenty seconds in the lower pool. This encounter resulted in a cut on Louie's nose. Sharky moved to the upper pool and Louie to the lower log where he rolled and rubbed his face. Sharky then did the same in the grass.

There were more short spats during the morning, one of which resulted in circling

behavior form Sharky, but it was noticed that they did not seem to be watching each other, only casually running into each other. there were times when Sharky would be swimming in the upper pool and hit a floating piece of bark and come shooting out of the water as if he was being chased. Louie seemed to be slightly nervous during the day and somewhat distracted by the public. He did not eat at the morning feeding and Sharky did not attempt to eat Louie's food. By afternoon they were sleeping at opposite ends of the exhibit. At the afternoon feeding, Sharky would not go into the pool for fish and Louie ate only herring thrown in his log.



Exhibit showing holding guillotine doors to dens. *Photo by Jan Outlaw)*

On the morning of 19 April, Louie was found sleeping in the dens and Sharky was in a log. There were several very short spats in the morning resulting in some circling behavior by Sharky and both otters were more vocal than before. Both ate fairly well in the morning but not at all that afternoon. By 22 April, they were wrestling and playing with no vocalizations or injuries. Louie seemed to be initiating the play but Sharky did not always join in. They were still not eating at the afternoon feeding. By 25 April they were both sleeping in the lower log.

Throughout the summer the otters have gotten along well and have been more active and playful than any other pair during the past five years. They spend more time swimming and playing. When they are resting they are usually in the same log, under the same bush, or on the same rock. With the previous exhibit mates (females) there had been fights over food, but these two will eat side by side with no conflicts. Sharky has also decreased his circling behavior

and no longer has his race track at the front of the exhibit. He sometimes swims in circles or travels from one pool to the other turning circles but the overall behavior has greatly decreased.

It will be interesting to see if this relationship continues into the winter (Beckel, 1991) or remains the same as Louie grows older (Rock, 1994). So far it seems we made the correct choice for Sharky regarding socialization, overall exhibit activity, and reduction in behavioral problems.



River Otters Louie and Sharky (Photo by Jan Outlaw)

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Acknowledgments

Thanks to Kris Hall (Education Coordinator) and John Tobias (Superintendent) for their editorial suggestions.

Animal Reintroductions and Endangered Species, Part 1

*By Terry D. Webb, Sr. Keeper, Primate Department
Brookfield Zoo, Chicago Zoological Society, Brookfield, IL*

Abstract

Exploding human populations, direct killing by man, introduction of exotic predators and competitors, spiraling destruction of ecosystems, environmental toxins, and the absence of enforced wildlife laws are all factors contributing to the endangerment and extinction of wildlife. Before the appearance of man extinction was always a result of natural phenomena. One of the many conservation methodologies in use to assist wildlife is reintroduction. Lack of suitable habitat, politics, costs, and education of the public are some of the factors to consider when undertaking any reintroduction. Public awareness of conservation is probably the greatest indicator of success. Other evidence includes a viable population, government involvement and awareness, and protection of habitat. Success or failure can be difficult to determine, but with limited time for many species, reintroduction will be a serious conservation choice to consider.

Introduction

A reintroduction is the release of a species into an area from which it is extinct or will probably become so due to low population densities. The purpose of reintroduction is primarily, but not solely, to establish a self-sustaining and viable population. Captive bred stock is usually slated for eventual reintroduction. Another method of reintroduction is the relocation of existing wild individuals to their former range. This paper will address the history, current status, opinions, concerns, and future of animal reintroductions.

History

A survey of the literature revealed that reintroductions are considered by most authorities to be an important conservation tool. The idea of putting animals back into their natural wild habitat is far from novel. The literature reveals that more reintroductions have taken place than are commonly acknowledged, and few have been scientifically documented. "Back to the wild" has become the new wave in conservation. As early as 1890 reintroduction efforts were being exercised for the Snowy Egret (Wemmer and Derrickson, 1987). Two of the better known early reintroduction programs involved the European and American Bison. In 1907, a plan to save dwindling numbers of the American Bison went into effect at the Bronx Zoo in New York (Sunquist, 1993). The European Bison became extinct in the wild during the 1920's. Now the American Bison numbers approximately 100 thousand (Sunquist, 1993) and the European

Bison approximately 3 thousand (Durrell and Mallinson, 1987; Sunquist, 1993) in the wild because of the work of zoos and reintroduction programs. Some of the other programs which have helped to save endangered species are:

<u>Species</u>	<u>Threatened/ Extinct in the wild</u>	<u>Reintroduced To</u>
Arabian Oryx (Durrell & Mallinson, 1987; Rice, 1989)	1972	Oman, Jordan, Israel
Pere David's Deer (Durrell & Mallinson, 1987)	1939	China
Scimitar-horned Oryx (Durrell & Mallinson, 1987)	1935	Tunisia
Przewalski's Horse (Bouman, 1982)	1950's	China & Mongolia
Caribou (Durrell & Mallinson, 1987)	1900	Maine
Swift Fox (Durrell & Mallinson, 1987)	1938	Canada
Musk Ox (Durrell & Mallinson, 1987)	Several Thousand Years	Soviet Tundra
American Bison (Durrell & Mallinson, 1987)	1890	U.S. Plains States
Hawaiian Goose (Durrell & Mallinson, 1987)	1949	Hawaii
Whooping Crane (Durrell & Mallinson, 1987)	1942	U.S.A.
Griffon Vulture (Durrell & Mallinson, 1987)	1940	France
Crocodiles (Durrell & Mallinson, 1987)	1975	India
Beaver (Durrell & Mallinson, 1987)	1850	Czechoslovakia

The frequency of reintroduction projects, reintroduced species, and individual reintroduced captive born animals, can be summarized by taxonomic class from 1900 to 1994:

	<u>Projects</u>	<u>Species</u>	<u>Individuals</u>
Mammal	46 (32%)	39 (31%)	2,317
Bird	65 (45%)	54 (43%)	39,054
Reptile & Amps.	23 (16%)	22 (17%)	31,483
Fish	9 (6%)	9 (7%)	3,201,050
Invertebrates	2 (1%)	2 (2%)	1,391
Totals	145 (100%)	126 (100%)	13,275,295

(Olney, Mace, & Feistner, 1994).

Positive Aspects of Reintroductions

Shepherdson states that reintroduction programs will play a very small role in conservation, but they can and will save some species from extinction and can create extreme enthusiasm throughout society (Shepherdson, 1990). Campbell believes that any captive species should be managed in a way that would prepare the species for reintroduction if the need or opportunity should arise (Campbell, 1980). Animals bred and reintroduced in their original habitat excite and generate local interest and education. Additionally, reintroductions serve the broad aspects of wildlife and ecosystem preservation providing indirect benefits. In general there is an elevation of awareness and value to conservation programs. Moreover, animals released into their original or restored habitats encourage efforts for entire ecosystem protection and conservation. A broader definition of success would include a look at local involvement where people value the species and participate in the recovery efforts. This would compliment government involvement and public education. Wild animals born from reintroduced parents are just one demonstration of success. Other measures of success are data on the species' natural history gained through associated research and monitoring of the project; involvement from local citizens and communities; and habitat conservation efforts which assist other imperiled species. Michael K. Phillips illustrates how involvement of the local community in a project promotes success of a reintroduction:

“...The reintroduction of red wolves into Alligator River National Wildlife Refuge (ARNWR) was accomplished only after the U.S. Fish and Wildlife Service (USFWS) carried out an educational program that prompted many people to change their attitudes toward the species, even so-called “varmints” like wolves. However, prior to reintroduction at ARNWR, most U.S. citizens knew very little about red wolves. The reintroduction project allowed “flagship” species for

conservation. Thus, since 1986, the USFWS has been able to use the ARNWR red wolf project as a vehicle to present information not only about wolf restoration, but also about the plight of other endangered species and environmental issues" (Phillips, 1990).

Other such "flagship" conservation species are the Puerto Rican crested toad (Puerto Rico), Pere David's deer (China), and the golden lion tamarin (Brazil). Such species bred in captivity and released in their original homelands bring local and national interest and pride.

By taking a multi-disciplinary approach, success is not limited to a viable population of at least 500 animals. Kleiman states: "...In the case of the golden lion tamarin Conservation Program we feel that the combination of activities and the interaction among separate components of the program have resulted in much greater success towards our ultimate goal of preserving golden lion tamarins and the Atlantic Coastal Rainforest than if we had concentrated on only one or two aspects" (Kleiman, 1990).

The success of any project can only be evaluated in terms of its goals and objectives. The IUCN Reintroduction Specialist Group have set forth some goals or objectives for reintroductions: "...to enhance the long term survival of the species; to reestablish a keystone species (in the ecological or cultural sense); to increase or maintain biodiversity; to provide long term economic benefits to local people; or to achieve a combination of all the above" (Olney, Mace, & Feistner, 1994).

The reintroductions considered to be the most successful have all been comprehensive efforts involving a large team and many resources. (Griffith et al. 1989), in their analysis of projects involving the reintroduction of captive bred animals and translocation of wild born animals, and using project managers' judgments or success, estimated 38 and 75 percent of the projects successful respectively (Olney, Mace, & Feistner, 1994).

"It would seem prudent, therefore, to propagate as many endangered forms as is economically and technically feasible for reintroduction," (Soule & Wilcox, 1980).

Some species may not survive without these programs; reintroductions elevate local and international conservation awareness efforts, they assist with the restoration and conservation of habitats and ecosystems which could provide other options for different programs, and finally they allow for gene transfer to small isolated populations. The most important goal of all is to determine where captive breeding and reintroduction make the most sense in the holistic approach to conservation management (Kleiman, 1990).

Negative Aspects of Reintroductions

However, although reintroductions are considered to be one of the most effective conservation practices, there are opponents to this practice. Ben Beck of the U.S. National Zoo in Washington, D.C. has commented that of 146 reintroductions involving 126 different species (over 13 million captive born animals), he only

considers sixteen to be successful, (approximately eleven percent) (Sunquist, 1993). But this definition of success is based on the project creating a self-sustaining population of at least 500 animals. This estimate of success may be narrow in scope because it is limited and conservative. David Shepherdson states, "It is true, too, that the majority of reintroductions to date have not been successful" (Shepherdson, 1990).

Reintroduction is not fully accepted by many in the conservation community. Some of the perceived problems include the fact that the animals do not remain in the area from which they are released. Diseases may be carried and transmitted to wild populations from captive bred stock. Also, there is concern in the agricultural community that released animals may transmit diseases to their livestock. Some captive born animals do not adapt to their new homes. Laws and bureaucracy often block reintroduction plans. The social and political attitudes around the release site may impede a reintroduction program (Toone & Hanscom, 1991; Kleiman, 1990). All sources consulted note that the costs will be tremendous throughout all phases of a reintroduction. The techniques for captive breeding, training for the wild, and release into the wild have not been perfected for many species. Disease appears to cause high losses of reintroduced animals and at times to the remnant population. However, the most pressing problem is the availability and cost of habitat. The total money spent for the golden Lion tamarin release in Brazil was approximately one million dollars over a seven year period (Sunquist, 1993). Kleiman says, "Costs should go down as techniques are improved, but so far, that's approximately \$22,000 for each surviving tamarin" (Sunquist, 1993). The Oryx program costs millions of dollars each year. (Sunquist, 1993). Some people would like to see funds go to other areas of conservation.

"Ullas Karanth, a biologist with the center for Wildlife Studies in India, calculates that \$30,000 a year would pay 50 guards to patrol enough habitat for 250-300 Lion-tailed macaques, whereas reintroducing only a dozen would cost \$150,000." (Sunquist, 1993).

These problems indicate that reintroduction opportunities will not always be considered successful or possible. Nevertheless, anything may and could be possible.

(Part 2 will cover Guidelines for Reintroduction, The Roles of Zoos and Conservation Organizations and Criteria for Determining Success of a Reintroduction, plus bibliography.)





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TRAVEL INFORMATION

Continental Airlines will be handling travel arrangements for the Conference.
If you would like further information, please contact Susan or Barbara at
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AAZK Announces New Professional & Contributing Members

Thomas J. Mello, Jr., **Capron Park Zoo (MA)**; Chris Waldron, **Philadelphia Zoo (PA)**; Sherry Samuels, **North Carolina Museum of Life & Science (NC)**; Lucia F. Meeks, **Hollywild Animal Park (SC)**; Timothy Clay Nowlen and Terry Burnett, **Jackson Zoological Park (MS)**; Woody Heabler, **Cleveland Metroparks Zoo (OH)**; Tim Houle, **Detroit Zoo (MI)**; Marie Perez, **Lincoln Park Zoo (IL)**; Thomas Jay Cordle, **Omaha's Henry Doorly Zoo (NE)**; Randal Berry, **Little Rock Zoo (AR)**; Marcus Cook, **"Leopard One" Zoological Center**; Catherine Fereday, **San Antonio Zoo (TX)**; Kristi Kennedy, **Wildlife World Zoo (AZ)**; William R. Winhall, **Sea World of California (CA)**; Brenda J. Clawson, **Honolulu Zoo (HI)**; Steven D. Elwood, **Wildlife Safari (OR)**; Nancy Ward, **Lilac Grove Wildlife Sanctuary (Ontario)**; Elaine Sutton Kelly, **Assiniboine Park Zoo (Manitoba)**.

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U.S.A.



Hand Rearing a Tufted Puffin Chick

By Tiffani Thompson, Senior Aviculturist
Sea World of Florida, Orlando, FL

The 1994 Alcid breeding season at Sea World of Florida gave the Aviculture Department the opportunity to hand-rear a tufted puffin (*Lunda cirrhatus*). The adult birds had proven to be excellent parents and although we routinely pulled the chicks at three weeks of age to fledge in a controlled environment, we had not yet hand-reared any species of alcid from Day One. This was an end of the season "unwanted egg" that we opted to turn into a positive experience by gathering some information and expertise through hand-rearing the chick.

We contacted other zoos that house alcid species and were told that they are difficult to raise. The alcid exhibit had had video monitors mounted inside since the exhibit opened and we have well documented the parent/chick feeding behavior during this time. The decision was made to try and emulate this feeding behavior as closely as possible and we used the recorded weights taken on chicks that were parent-reared during previous breeding seasons as our growth indicator.

We were aware from failed attempts in our institution that impaction could be a problem and because of this we chose to feed the chick *ad lib*, waiting for it to tell us when it was hungry. We waited approximately one hour after the chick began showing hunger signs to feed it. This was to make sure it was "empty". The chick's breath was also routinely checked for sour crop.

To avoid dehydration we injected all the fish with water as well as soaked the fish in water prior to feeding it to the chick. If dehydration had occurred, subcutaneous fluid in the leg was an option given to us by another institution.

Another problem we were warned about was thermoregulation. Once again we let the chick dictate the temperature where it was comfortable. When the chick hatched, at 0700 hours., the brooder temperature was set at 96° F (35.6° C). By 2100 hours the same day the temperature had been dropped to 87° F (30.6° C) and the following evening was down to 83° F (28.3° C). From then on, the temperature change was much more gradual.

The chick was taken home by a keeper until it reached 14 days of age, at which time, even with the use of ice packs, maintaining a comfortable temperature for the chick was difficult. It was then moved to a climate-controlled room set at 50° F (10° C). Other adult puffins were housed in this room, which gave the chick the opportunity to begin interacting with its own species.

Once the chick began feeding on its own, large weight gains occurred, and the

number of hand feedings was cut back. We began swimming the chick at 39 days of age. Until the chick fully waterproofed, the swims were monitored and given three times daily. At 43 days of age when its waterproofing was much improved and preening was observed, the chick was allowed constant access to the pool. It was introduced into the alcid exhibit at 62 days of age without incident.

The following is a chart describing the feeding regime we used. The fish were not weighed prior to feeding, but a general size was given to the chicks (see sizes below). Although we did not follow the 10% rule, we did regulate the total amount of fish fed at each feeding.

Silversides (*Merridia merridia*) sizes:

small	=	up to 2 grams
medium	=	2 to 4 grams
large	=	4 grams and up

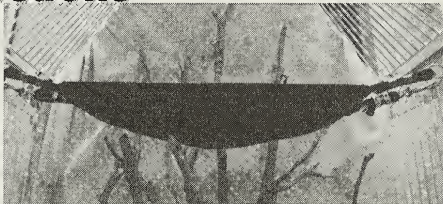
At 26 days of age, Whitebait (*Allosmerus elongatus*) was introduced into the diet.

Krill (*Euphasia superba*) was not used at all in hand-feeding as previous krill impactions have been documented in young alcids.

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Age in Days	Weight	Brooder Temp.	Number of Feedings	Amt. of food per feeding	Total Food
1	hatch wt 55.1g	96°F @ 7am/87°F @ 9am	-0-	-0-	-0-
2	51.9g	down to 83.1°F by 11pm	3	½ of a small ss	1½ ss
3	52g	78-80°F	4	1 small ss	4 ss
4	60g	78-80°F	4 dly vits 25mg B1, ¼ 10g cs#, ¼ 1 multi	1 medium ss	4 ss
5	72g	77-78°F	5	1½-2 medium ss	7½ ss
6	82g	76-77°F	5	2-3 medium ss	12 ss
7	97.5g	75°F	4	3 medium ss	12 ss
10	146g	70°F	4	4-5 large ss	18 ss
13	214g	63-65°F	4	up to 5 lrg ss *at 2 fdgs only took 2-3ss do not push to eat	16 ss
14 - bgn lv @ work Iso rm	241g	54-60°F	4	hand fd up to 5ss - bgn lvg a tray w/2ss -ate frm tray 2x	24 ss
17	306g	46-50°F	4	handfeed 2 ss leaving tray with 5 ss	28 ss
26	533g	46-50°F Iso Room	4	hand fdg 1 fish lv tray w/ 10 fish-whitebait & silversides	34 fish
29	640g	46-50°F Iso Room	3 only hand feed vit fish	10 fish plus 5 pieces of krill	28 fish + krill
33	655g	46-50°F Iso Room	3	same, but began giving clams and squid	

Preparation For The Crisis Management Situation In A Zoological Institution

By
William K. Baker Jr., Zoologist
1209 Tom Temple Dr., Lufkin TX 75904-5560
&
Patricia M. Hainley, Zoo Keeper
Ellen Trout Zoo, Lufkin TX 75904

Abstract

The crisis management situation is often a preventable circumstance that can be addressed by an institution using a proactive safety program that incorporates the concepts of keeper attitude, training, and preparation. A response to the unavoidable crisis situation can be effective if the zoological professional understands the parameters of zoological, natural, and man-made disasters. By utilizing a safety and training protocol that is teamwork-oriented, the response by the facility staff to a crisis management situation has the potential to be professional and effective.

Introduction

The professional in a modern zoological institution is often faced with more than animal husbandry and management during the course of their duties. A staff member may be called upon at any time to respond to a crisis situation that could be a result of animal containment failure, zoo keeper error, human-animal interaction, or a natural disaster. The effectiveness of the crisis response will be greatly dependent on the experience, training, and attitude of the staff when they react to the situation. By taking a proactive approach to preparing a facility and its staff members, it is possible to prevent many crisis management situations and respond effectively to the unavoidable crisis.

Keeper Attitude

It is often difficult to define the relationship that zoological professionals have with the animals in their care. The reasons that people choose this profession are as diverse as their individual personalities. Yet, it is the personalities and the subsequent attitudes of the professional that come into play when faced with a crisis situation. It would be impossible to consider the concepts involved in preparation for a crisis management situation without coverage of this important facet. Because when the cards fall, the prevention and response to a crisis situation is determined by the individual attitude and the training that has influenced it.

Classical training in the field of science should never be underestimated. It is

within the university setting that the basic concepts of zoology and wildlife management are founded. This provides the professional with the framework to understand the nature of the environment, the tools to question and answer, understand the unknown, and communicate effectively with fellow professionals. Through a classical college education and individual begins to understand animals and the part they play in the environment.

Knowledge of the natural and behavioral aspects of a species is necessary to extrapolate the actions of a captive animal. This knowledge provides an understanding of the social dynamics, structure, and hierarchy of a captive species population. When integrated with specific captive animal histories, and the personalities of individual specimens, it becomes clearer how a captive population might respond in a given situation. However, the accumulation and understanding of knowledge doesn't stop once the job starts. Continuing education should be a constant factor and would include exposure to scientific journals, workshops, and conferences. The learning process is a continuous action, that is tempered by the most important teacher of all, experience.

Experience can take the form of personal and professional in its expression; And while personal experience is an excellent teacher, so too are the experiences of others in the profession. Simply put, there is no reason to reinvent the wheel. The experiences of others will always outweigh the sum total of one person's experience. Communication and the active exchange of ideas with peers in the industry on concepts, data, and species behavior often provides new insight into an old problem. It is important to remember that communication should begin within the institution. The open exchange of information between staff members is critical to safe and progressive animal management. This exchange can take the form of staff interaction, daily reports, and staff meetings; the important thing is that it takes place. Without a constant flow of updated information on changes in animal behavior, medical situations, and exhibit condition, it is impossible to make an informed and safe decision. In short, prevention starts at home.

Probably the most difficult aspect of the keeper attitude is professionalism. Professionalism is a difficult topic as it is such an abstract concept and means different things to different people. However, it is possible to focus on key factors that could compromise keeper safety and lead to a crisis management situation. These key factors would be threat assessment, detachment, and complacency. Threat assessment is accurately recognizing the possible dangers associated with a specific species and understanding the constantly changing environmental parameters, (i.e., behavior, hierarchy, medical, exhibit, weather, and public), before interacting with that species. Detachment is the ability to isolate personal feelings from the animal management situation. Anyone who has worked any amount of time in a zoological facility has their favorite species and individual animals. Yet, as professionals it is important to remember that while we are "keepers of the wild", these animals are wild and do not belong to us; but, to the institution they reside in and to the wild places themselves.

Complacency is probably the most dangerous of all of the listed factors. All too often professionals in the animal industry underestimate the abilities of their charges. It can be a result of individual apathy brought on by job dissatisfaction or simply becoming accustomed to the routine of daily duties. The end result is that it leads directly or indirectly to a false sense of security and compromises personal safety of the individual and co-workers. As a zoological professional interacting with animals, it is important to stay focused on the here and now. Because the truth is, whether the zookeeper takes the situation seriously or not, the animals assuredly will.

Training

The training experience and the learning process have similar features. Both concepts share in the progression of accumulating knowledge and experience. However, training in its purest sense implies that an individual is receiving instruction based on the prior experiences of another and usually for a specific task. It is also understood that if training is to be effective, it must be consistent; yet, the training must be flexible enough to allow growth. Guidelines for staff members should be documented in a clear and concise format, and be readily accessible to all personnel. The transition from document to actual instruction should reflect as little change as possible. This should insure that all staff members receive consistent training with as little personal interpretation as possible. Using this approach everyone should be on the same common ground and communicate more effectively with co-workers. An ideal example of this would be the zoological facilities that have established Keeper Training Programs.

In the ideal crisis situation everyone would be where they were needed, reaction time would be fantastic, and the situation would be resolved quickly or would have been prevented altogether. Unfortunately, we do not live in a perfect world. The reality is that a problem will occur when least expected and at the most inconvenient time. The best way to prepare for the crisis management situation is to train the staff to constantly observe their animals and exhibits in order to discover possible safety hazards and future problems. If this sounds simple and easy, it's not. There is nothing easy about taking a facility-wide proactive approach to safety. It takes a great deal of self-discipline to integrate this concept and maintain it for an indefinite period of time.

An increase in staff potential can be realized by pursuing other training options. By conducting in-house workshops on a rotating basis with other animal sections it is possible to increase the flexibility of the individual to respond to a variety of situations. If time and staffing permit, the use of cross-training in animal sections other than the normally assigned area has great potential for providing a even greater depth of experience. Seminars can be conducted on a monthly basis on different types of animal restraint and how it is utilized with different species. These types of activity also have the advantage of increasing communication and reducing friction between animal sections. The effectiveness of the crisis management response in an institution can be expected to be more

reliable when staff members train and work in a teamwork oriented environment.

Whenever possible an institution should pursue specialized training. Instruction in CPR, First Aid, and Disaster Training is available from local Red Cross Chapters. Local Fire Marshals often conduct programs in fire safety, SCBA, and the handling of hazardous materials. OSHA has developed specific guidelines on handling safety concerns in the workplace and should be reviewed with the local representative before the need for inspection arises. Defensive Driving training should be a consideration whenever staff members have to operate motor vehicles.

Institutions that have an Emergency Response Team, (ERT) or Crisis Management Team, (CMT) should take advantage of all specialized training that is available in their area. If the facility maintains firearms on site for response to dangerous animal situations, training is available from law enforcement agencies, NRA Instructors, and Hunter Safety Instructors. If an institution does not have a Law Enforcement Agreement with the local agencies, it should consider pursuing one. This agreement clearly defines the parameters of response and authority in a dangerous animal escape situation.

Aquariums and facilities that have aquatic exhibits have special training needs. Staff members that work in these areas should be SCUBA qualified through a certified agency, (PADI, NAUI, SSI, or YMCA). Courses are available in safety oriented areas as well, such as Medic First Aid, (MFA). Oxygen Provider programs are available through the instructors of the Divers Alert Network, (DAN). Certified divers should consider taking a SCUBA Review course once a year to update skills and keep abreast of changes in dive protocol. Courses in life saving skills, water safety, and crisis management are available through the Red Cross and certified dive agencies that offer Rescue Diver Courses. If a facility maintains its own compressor and tank-fill station, consideration should be given to sending a staff member to a Cylinder Inspection Course. If maintenance is performed in-house on equipment or divers use tools in an underwater environment, an Equipment Specialty course might be in order. In a large aquatic park, it may even be worth considering having staff members trained as instructors in one or more of the disciplines described above. This would provide low-cost training and allow better time management.

Preparation

A proactive safety program should incorporate the features of keeper attitude, training, and physical preparation. However, theory and training can only go so far without advance planning and technical support. Emergency fire, safety, and first aid equipment should be in position for use and inspected at regular intervals.

Essentially, crisis management situations can be classified into three categories: Zoological, Natural, and Man-made Disasters. Each category has features that

distinguish it from the next; but, all have similar features and some degree of crossover. Examples of zoological crisis situations would be dangerous animal escapes and human-animal interaction. These situations are classified by the threat or potential threat to human life. Natural disasters are classified as acts of nature and would include severe weather, fire, flood, tornado, earthquake, and hurricane. Man-made disasters are classified as events that are a result of human interaction and/or failure of a man-made structure or service. Examples of this would be power outage, containment failure, hazardous material spills, and terrorist or bomb threat (a real possibility in light of the growing trend of domestic terrorism).

While it isn't feasible to address all the possibilities and precautions for a crisis management situation in this paper, an attempt has been made to provide some general guidelines.

Zoological Disaster:

1. An institution should have an ERT or CMT composed of staff members that receive training for responding to animal escape situations.

2. The ERT or CMT should have dedicated equipment that is separate from the equipment kept in animal sections for daily use. Emergency practice drills should be held quarterly. Conduct annual firearms qualification and practice quarterly at the minimum.

3. All animal sections should have capture and restraint equipment on hand in their work areas. Staff members should receive training and be familiar with the equipment.

4. All animal sections and work areas should be equipped with first aid/trauma kits and eye wash stations. Reptile sections will also require envenomation response kits. Inspect and refill quarterly.

5. Rescue equipment such as collapsible ladders, cutting torch, bolt-cutters, tool kits, first aid/trauma kit, ropes, stretchers, animal control poles, and CO2 fire extinguishers should be available for those occasions when the public comes into contact with animals.

Natural Disaster:

1. Fire extinguishers, (ABC dry chemical, H2O, and CO2) should be present in all work areas. Fire alarms that connect to the local fire department should be located in key work areas. Cylinders should receive a hydrostatic test every five years to test for metal fatigue. Inspect annually.

2. Insure that flashlights, battery powered lanterns, and extra batteries are located in all work areas and emergency backup lighting is present in all buildings. Larger facilities should consider the use of pole mounted area lights. Inspect quarterly.

3. Insure that some alarms and carbon monoxide detectors are present in all work areas. Inspect quarterly.

4. Maintain an alternate water supply or have the means to purify water for the facility. An alternative method would be to take animals off display and fill all moats and water exhibits with fresh water and purify with a bleach or iodine solution. Remember, in severe flooding or hurricanes, the water supply will be compromised.

5. Maintain a supply of construction materials in a secure location at the facility in order to begin emergency repairs after severe storm damage. Also, insure that the commissary has sufficient food supplies to feed the entire collection for 14 days.

Man-made Disasters:

1. A facility should maintain Emergency Support Equipment, (ESE), that could restore vital services. Examples of this would be: generators, portable area flood lights, water pumps, and heavy construction equipment.

2. Always keep radios in working order and maintain charged extra batteries. Use coded transmissions when transmitting, as most news services use scanners. Also, do not use radios or the repeater when a bomb threat has been received. Explosive devices often use radio activated triggers.

3. All facilities should be able to respond to some degree to a hazardous material spill. Aquatic exhibits that require the presence of acids and bases should have eye wash stations, acid-showers, and a Self-Contained Breathing Apparatus, (SCBA). For daily keeper use always maintain protective eyewear and respirators with the appropriate filters. Also, it's advisable to maintain a blood borne pathogen clean-up kit in light of today's transmittable diseases. Inspect quarterly.

4. Emergency containment material should be stored in or near keeper work areas in order to perform repairs or provide temporary animal containment. Examples of this would be prefabricated sections of mesh or shade cloth, portable fence, vari-kennels, and battery operated hot-wire systems.

5. All facilities should have an emergency evacuation plan for the public and staff. If possible, consideration might be given to evacuation of certain specimens or endangered species, (CITIES, Appendix I) when faced with the approach of an extremely severe storm, such as a hurricane.

Conclusion

The crisis management situation in a zoological institution is one of those topics that professionals encounter occasionally in their careers and realize that there is rarely a middle ground. This more likely than not is due to the negative

publicity, liability, and inevitable lawsuits that follow an incident; and, for these reasons and others such as ethics, morality, and the never ending debate of animals in captivity, it will always be a controversial topic. Yet, the thought occurs, if we do not police the safety of our industry and its facilities, how long will it be before an outside agency decides to do it for us?

(About the Author: Since 1985 Bill has been active in the fields of science, zoology, and wildlife management. His education and experience include a B.S. in wildlife management and post-graduate studies in zoology, Lab and Museum Assistant, Shoot Team Leader, ERT Member, Senior Keeper and Large Mammal Keeper at various AZA facilities. His area of research is crisis management in zoological institutions, which draws upon practical experience and training as a Rescue Diver, Hunter Safety Instructor, and Red Cross CPR/First Aid Instructor. He is currently on research sabbatical studying crisis management and conducting the North American Crisis Management Survey.)



Book Review

Into Africa

By Craig Packer, 1994

University Of Chicago Press

5801 South Ellis Ave., Chicago, IL 60637

Hardback, 300 pgs. Price: \$24.95

*Review by Kelly K. Miles, Zoo Volunteer
Woodland Park Zoo, Seattle, WA*

Into Africa is a rich and descriptive diary of Craig Packer's 52-day return trip to Africa in 1991. A field biologist since 1972, the author conveys through his experiences the real world of field research. On this trip the author trains new lion research field assistants in the Serengeti and collaborates with Jane Goodall on the baboons and chimpanzees of Gombe.

The reader is taken through a full spectrum of experiences which the author vividly describes, from the purchasing of a Rover and maintaining it through travel on rough terrain, to preserving lion blood samples for DNA analysis. Strategically placed detailed maps enable the reader to closely follow this journey. The author's eight pages of rich photographs which include the crimson Serengeti sunset, the emerald green upper slopes of Gombe and numerous photos of animals, aid the reader in mental imagery.

Into Africa also explores the social lives of the animals and the threats to their survival. Throughout the book the author writes of the human ability to preserve wildlife and the ecosystem.

This book is ideal for those who have ever dreamed of doing field research or were curious as to what it is really like. This book gives you the realistic perspective, the good and the bad, of life in the field.

Chapter News Notes

MetroBoston AAZK Chapter

The MetroBoston AAZK Chapter is offering a limited edition T-shirt from Franklin Park Zoo which features the Eider (see design inset). The white, 100% cotton shirts feature a five-color design and are available in LG, XL and XXL. Cost per shirt is \$15.00 which includes postage and handling. Make checks or money orders (U.S. funds only) payable to MetroBoston AAZK and send, along with your name and mailing address, number of shirts and sizes desired to: Pete Costello, Franklin Park Zoo, One Franklin Park Rd., Boston, MA 02121.

—Colleen Dougherty, Secretary

E I D E R



FRANKLIN PARK ZOO

Edmonton Chapter, Valley Zoo

The Edmonton Chapter has been relatively inactive for the past year or so. In the past few months, however, things have changed and the Chapter has regained a pulse.

In February we were fortunate enough to have Lynn Calaro of the Marine Dolphin Research Institute of Florida present a talk on marine mammal stranding. We had a great turnout and she gave us an entertaining and informative talk. Our Chapter will be donating \$250.00 to the research institute. We also made a donation of \$250.00 to Dr. M. J. Willard of the Villa Vet Clinic in Winnipeg, Manitoba for her work in relocating unwanted pet red-eared slider turtles.

We are presently working on several projects including an **Endangered Species Display Cabinet** for donation to the Valley Zoo. For the first time ever we will be Bowling for rhinos thanks to the hard work of Dave Labelle who was our last year's representative to the National AAZK Conference in Denver. Our fundraising efforts over the past year totaled approximately \$600.00 in pop can returns. This year we are looking at new additional fundraising ideas.

Our Chapter elections were held recently and our new officers for 1996 are:

President.....Jan Tollenaar
Vice President.....Torsten Eide
Treasurer.....Brenda McComb
Secretary.....Dina Riddick

We would like to thank our outgoing President Wayne Sager and Secretary Michele Stade for their hard work in

the past few years and for holding the Chapter together.

—Jan Tollenaar, President

Rocky Mtn. Chapter (Denver, CO)

New officers for the Rocky Mountain Chapter are:

President.....Susan Nolan
Vice President.....Mark Marciniak
Secretary.....Karen Stern
Treasurer.....Chris Bobko
Chapter Liaison.....Vicki Sawyer

We will be closing our conference checking account so please cash any outstanding checks by **1 July 1996**. Our Chapter will be meeting to discuss our Bowling for Rhinos event.

—Vicki Sawyer, Chapter Liaison

Puget Sound Chapter

New officers for 1996 are:

President.....Tina Mullett
Vice President.....Allison Barr
Sec'y/Chapter Liaison...Carol Simkins
Treasurer.....Roz Sealy
Zoo Society Liaison...Harmony Frazier
Special Events Coordinator.....

Marcy Beyer
Conservation Committee....Mike Tong

Our Chapter ended 1995 with our annual silent auction. This event provides funding for Chapter projects for 1996 and netted close to \$4,000. This year we are supporting three conservation projects. Locally, the Woodland Park Zoo is involved in a Western Pond Turtle Recovery & Headstart Program. The Chapter is purchasing equipment for this program.



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Pacific Northwest AAZK Chapters Unite for Conservation

On an international level we are continuing our support of tree kangaroos by providing funding for the first field research project in New Guinea to census Matschie's tree kangaroos. The project head is Chapter member Lisa Dabek of the University of Washington.

The second international project that we chose to support is a similar research project that involves censusing sun bears in Thailand. This three-year project is being conducted by David Garshelis (Minnesota Dept. of Natural Resources) with James L. David Smith (Dept. of Fisheries & Wildlife, Univ. of Minnesota) and Porchai Patumrattanathan (Royal Thai Forestry Dept., Khao Pratubchang Wildlife Breeding Center, Rachaburi, Thailand). Both of these projects have a high priority with their respective SSPs and will provide the first census data on these animals. Both projects are currently seeking additional funding. Any individuals or Chapters interested in seeing their conservation dollars really make a difference and help support some much needed field research, please contact Allison Burr c/o Puget Sound Chapter AAZK, 5500 Phinney Ave. N., Seattle, WA 98103.

Chapter members are looking forward to our second annual spring book sale on 18 May. Proceeds from this event are going to the tree kangaroo census project. We have been soliciting book donations since February and anticipate surpassing last year's total of \$1800.00.

--Carol Simkins, Chapter Liaison

Puget Sound Chapter Conservation Committee Co-chair, Mike Tong, is currently coordinating a joint sponsorship of a Marine Conservation Meter through the Center for Ecosystem Survival (C.E.S.), with the Mt. Tahoma Chapter and the Point Defiance Zoological Society, at the Point Defiance Zoo and Aquarium in Tacoma, WA. This project has brought together the AAZK Chapters in the Pacific Northwest to help save some precious marine habitat.

The objective of the Marine Conservation Meter will be to generate funds for marine biodiversity protection particular for areas on coral reef systems. Funds will be used to support on-site monitoring and protection activities in marine parks and protected areas where local in-country partners are engaged. Our Chapter chose the Palau Micronesia site. It is considered one of the seven underwater wonders of the world. Palau is known for its magnificent coral reefs and fishes, including 200 species of soft corals, 400 species of hard coral and more than 1400 species of reef fish. Scientists believe this area to possibly be the most biologically diverse reef ecosystem in the world.

In the last two decades, the rich coastal and marine diversity of Palau has faced increasing threats, including direct threats from over-harvesting of fin and shell fish, and illegal poaching of sea turtles, crocodiles, giant clams, dugongs, and indirect threats from upland soil erosion and sedimentation of coastal waters, urban industrial pollution and the growth of resort development.

A Rapid Ecological Assessment conducted in 1993 (Donaldson) reported 733 species of fishes, including 136 new records. This total comprises about 70% of the known fish fauna from the main islands and the southwest island of Palau. Roughly 425 species of stony coral belonging to 78 genera and six sub-genera have now been reported from Palau since 1938. The species and genera total are comparable to those of the highest coral diversity areas reported from the Indo-Pacific regions of Indonesia, Australia and The Phillipines.

C.E.S., working in partnership with Noah Iechong, Director of the Palau Conservation Society, and Chuck Cook of The Nature Conservancy's Micronesian field office, will provide support for coral reef protection such as the installation and maintenance of 10-15 mooring buoys to prevent anchor damage, aid in the development of legislation on coral reef protection, and the sustainable harvest of marine resources to be locally managed.

The Puget Sound Chapter would like to thank the Mt. Tahoma Chapter, the Point Defiance Zoological Society and Tom Otten, Director of the Point Defiance Zoo and Aquarium for their support with this project.

FUNDS "SIPHONED AWAY": Congress is raiding the nation's largest source of federal funding for conservation land purchases "with almost no public awareness," says an article in the San Jose Mercury News. The article explains that \$900 million a year is taken in from offshore oil drilling royalties that is supposed to be used through the Land and Water Conservation Fund for buying parklands. "But since the early 1980's, cash-strapped members of Congress have raided it like bears at a picnic, taking three of every four dollars intended for parks and spending the money on other things." The article reports that this year, Congress voted to spend only \$138 million on parks, the smallest amount since 1974, with the remainder of the \$900 million going into the general fund. "It was a bargain that was never kept," said Interior Secretary Bruce Babbitt. "It's just that simple."

--from *GREENlines* Issue #121 5/13/96

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Legislative Update

Compiled by Georgann Johnston
Legislative Advisor
Sacramento, CA



Sea Turtle Regulations Up for Amendment

The National Marine and Fisheries Service (NMFS), a division of the Department of Commerce, National Oceanic and Atmospheric Administration, proposes to amend the regulations protecting sea turtles. The overall purpose of the amendments is to enhance their effectiveness in reducing sea turtle mortality resulting from shrimp trawling in the Atlantic and Gulf Areas.

The proposed amendments include deleting approval of the use of all soft turtle excluder devices (TEDs) and instead requiring the use of NMFS-approved hard TEDs by the end of 1996; requiring the use of headropes with lengths greater than 12 feet or footropes greater than 15 feet; establishing Shrimp Fishery Sea Turtle Conservation Areas in the northwestern Gulf of Mexico and in the Atlantic off Georgia, South Carolina and Florida; and prohibition of the use of bottom-opening hard TEDs.

Studies of the Kemp's ridley (*Lepidochelys kempi*), leatherback (*Dermochelys coriacea*), Loggerhead (*Caretta caretta*), and green (*Chelonia mydas*) turtles in the Gulf of Mexico and along the Atlantic seaboard have documented significant turtle mortality.

Source: *Federal Register Online* 24 April 1996, vol. 61, no. 80.

Bullet Train to Shoot Through Florida Everglades

Florida transportation officials recently endorsed a plan by the Florida Overland Express (FOX) to construct an electric train between Orlando and Miami. The railway would run along the eastern rim of the Everglades. FOX officials have replied to concerns expressed by environmental groups by saying that the nearly \$400 million budgeted to buy easements through the Everglades will help that area which is home to a number of endangered species.

Source: *GREENlines Issue #100, an Online Project of Defenders of Wildlife*, 11 April 1996

Right Whales Dying at Unusually High Rate

The highly endangered right whale lost six members of its total population of 320 animals over the past year. The National Marine Fisheries Service has formed a panel to investigate the cause of death in the species and are considering factors

such as habitat loss, naval war games, collisions with ships and fishing casualties. There is also some information pointing to a build up of toxic substances in the animal's fat tissues, affecting their overall health. In conjunction with the formation of the investigatory panel, the Navy is devoting additional time to tracking the whales and the NMFS is considering expanding the critical habitat of the whales, who are found primarily off the coasts of Georgia and Florida.

Source: GREENlines, an Online Project of Defenders of Wildlife 9 April 1996

Italy Found Guilty of Violating Driftnet Ban

The U.S. Court of International Trade, a specialized federal court which handles disputes involving international trade issues, has found that Italy is in violation of the High Seas Driftnet Act with respect to fishing in the Mediterranean Sea. Under the rules governing the Court of International Trade, the U.S. Secretary of Commerce must formally identify Italy as an "international outlaw" and Italy then has 90 days to comply with the United Nations resolution that bans large-scale driftnetting. If Italy fails to comply within 90 days, the U.S. is required to cut off importation of fish and fish products coming from Italy, a \$1 billion annual business.

The ban was enacted for the purpose of protecting whales, dolphins, sharks, seabirds and other forms of non-fish life in the sea. Instead of complying, Italy also has the right to appeal the decision to the newly formed World Trade Organization. Such an appeal could significantly delay the curtailment of the use of the nets while the appeal is pending.

Source: In Brief, published quarterly by the Sierra Club Legal Defense Fund, Spring 1996

Bad News for Wildlife — House Passes Refuge Bill

On 24 April 1996, the House passed the "National Wildlife Refuge Improvement Act" (H.R. 1675) — a bill authored by Rep. Don Young of Alaska, the co-author of the bill designed to destroy the Endangered Species Act. The Refuge bill proposes changes in the management of the U.S. Wildlife Refuge System, allowing increased hunting, fishing, trapping and other recreational activities. The bill now goes to the Senate for possible modification and/or confirmation. As passed, the bill creates barriers to acquiring more refuge lands, allows increased military activities in refuges, and could result in the downgrading of the primary purpose of the refuges. Despite opposition by the Sierra Club, the Ornithological Council, Trout Unlimited, and the Sportsmen's Conservation Club, the bill passed the House by a vote of 287 to 138.

Source: Sierra Club Action Alert #193, 24 April 1996

Kenya Raises Park Entrance Fees

The Kenya Wildlife Service has announced an increase in the entrance fee for a number of its national parks. The increases range between 25 and 35 percent. David

Western, KWS Director, stated that the increases were in direct response to "the urgent need to limit visitors to popular parks with fragile ecosystems." Nonresident visitors to parks such as Amboseli, Aberdares and Lake Nakuru pay \$27, up from \$20, and visitors to Tsavo East and West are now charged \$23.

Source: African Wildlife News published by the African Wildlife Foundation, May-June 1996

Botswana's President Agrees to Investigate Declining Herd Numbers

Quett Masire, President of Botswana, has agreed to establish a special commission to investigate the decline of wildlife in that country. The agreement was in response to recommendations from a task force representing seven conservation groups who had studied the subject and issued a report entitled "Status of Selected Wildlife Resources in Botswana and Recommendations for Conservation Actions." Declining populations of buffalo, wildebeests, hartebeests and zebra are the major concern of the report, which says that Botswana's wildlife department "cannot implement progressive, comprehensive and innovative management strategies in its current condition. As presently constituted the department can only continue to preside over the decline of the resource!"

Assistance in the restructuring of Botswana's Department of Wildlife and National Parks will come from Britain's Overseas Development Agency. Issues to be addressed initially will include the establishment of corridors for wildlife between protected areas and the determination of optimal populations for given species including plans for action should populations deviate significantly one way or the other from the optimum.

Source: African Wildlife Update April 1996 vol. 5, no. 2, published by African Wildlife News Service, Olympia, WA

USFWS Director Speaks Out on Lifting of ES Listing Moratorium

In late April, President Clinton waived a provision in the omnibus appropriation act which would have continued the moratorium on the listing of endangered species. The moratorium has been in place since April 1995.

Mollie Beattie, Director of the U.S. Fish & Wildlife Service, issued a statement 2 May 1996 endorsing President Clinton's act, saying that the USFWS was just starting to reinstate the listing program. The reinstitution of the listing program will require rehiring and/or reassigning staff who were transferred or laid off from the listing processing departments during the past year's hiatus. Additionally, the USFWS is also faced with assessing the status of species which may have undergone population changes during the moratorium. Beattie expects to present a more detailed plan for starting up the listing program by the end of May 1996.

Source: USFWS News Release 5 May 1996

Animal Program Celebrates 25th Anniversary

*By Diana Guerrero, Alumni
EATM Class of 1983*

Where were you on February 25, 1996? About 175 animal professionals were attending the 25th Reunion of the Exotic Animal Training & Management (EATM) Program at Moorpark College in California.

The program is one of a few in the world which trains professionals for the zoological industry and other professions that deal with wild and exotic animals. The program has evolved over 25 years from a small compound with a wolf on a chain in 1971, into what is now called America's Teaching Zoo located on five acres of land with approximately 150 animals representing a wide variety of species.



The author with ETMA founder William Brisby

William Brisby, founder and original director of the program, attended this event. Most of the earlier students have many memories of the unique ways he found to "build character" in his students. One of the most famous were the rusty pipes which had to be relocated several times a year. "Briz" or "Gawd" were two of the nicknames this man acquired from those students. Little did they imagine how essential his "creativity" was to survival out there in the animal field.

The Class of 1983 was represented by a dozen alumni in different professions. It was an amazing gathering of people in professions ranging from zookeepers and movie industry animal trainers to behavior consultants, managers and even those involved in zoological design. Some attending were no longer in the animal field and involved in other pursuits which added to the diversity of the group.

Someone had a temporary lapse of sanity and left out 175 training clickers on the tables. They ended up in the hands of alumni waiting for the first opportunity to use them....and being the opportunistic group they are, the first window opened erupted in a chorus of clickers!

The event included a dinner, video compilations from the past 25 years, a slide

show, and a posterboard version of a scrapbook. For those alumni who did not attend, it was done in true EATM style.

Many visited the small zoo the following day to see animals they had worked with and to check out some of the new talent ready to emerge in the field. "Puppy" the turkey vulture, "Bubba" the squirrel monkey, and numerous other animals are still there torturing and training the new students.

For many attending it was a nice trip back, for some it was an opportunity to close a chapter in their life, and for others it was a great opportunity to touch base with friends from a unique and special past.

For more information on the EATM Program or on graduates contact: The Exotic Animal Training & Management Program, 7075 Campus Road, Moorpark, CA 93021.

Information Please

We received a pair of Short-eared elephant shrews and I would appreciate any information on them - reproduction, gestation, exhibit size, lifespan - anything! In the short time they've been here, they have already had one baby which we recently separated from the parents. Please send information to: Mrs. Maria Browning, Children's Zoo, San Antonio Zoo, 3903 N. St. Mary's St., San Antonio, TX 78212.

Publications Available

New Bat Book Available - now available, the all-new, 1995 edition of *BATS IN CAPTIVITY* by Susan M. Barnard. This edition contains 194 pages with 118 illustrations. Chapter sections include: aspects of rehabilitation and considerations for release; handling; transporting and temporary housing; environment and housing and both adult and infant bats; feeding of adult bats; hand-rearing of infant bats; health, medical and necropsy considerations; artificial hibernation; bats on public display; exercising captive bats; marking bats for identification; and maintenance of insect colonies. For more information contact the author at Zoo Atlanta, Dept. of Herpetology, 800 Cherokee ave. SE, Atlanta, GA 30315; Tel. (404) 624-5618; Fax - (404) 675-7514; email: pszoode@prism.gatech.edu.



Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 10th of each month to: Opportunity Knocks / AKF, 635 S.W. Gage Blvd., Topeka, KS 66606-2066. Please include closing date for positions available and when setting these dates keep in mind that because of bulk-mail, most readers do not receive the AKF until the middle of the month or later. There is no charge for this service and phone-in or fax listings of positions which become available close to deadline are accepted. Our phone is 1-800-242-4519 (U.S.); 1-800-468-1966 (Canada). Our FAX is (913) 273-1980.

LEAD KEEPER...the San Diego Zoo's Mammal Dept. is currently seeking a lead keeper of mammals to be responsible for all aspects of the management of mammals. Under the direction of the Animal Care Manager, the lead keeper will help with transport, husbandry programs, daily maintenance, animal enrichment programs, behavior modification, exhibit design, exhibit renovation and **staff selection, supervision and development** in a team environment. A lead keeper performs many functions of moderate difficulty under general direction. The lead keeper supervises and participates in the feeding and general care and welfare of assigned exhibits and animals. This class is distinguished from the next higher class, Animal Care Manager in that a lead keeper is a working lead as opposed to being a full supervisor. The lead keeper class is part of the union labor work force. The qualified candidate should possess a minimum of **five years** working in an AZA accredited zoological facility. Bachelor's degree or equivalent experience in Biology or a scientifically related field from a recognized institution is also preferred. Proven leadership ability, teamwork, organizational and communication skills, as well as direct experience with the management of a broad range of mammals is required. The Zoological Society of San Diego maintains one of the largest, most diverse and dynamic animal collections in the world. Changing and challenging conditions are normal for this collection. The lead keeper is a member of the animal management team and as such is expected to maintain and improve the standards of the Zoological Society of San Diego. The lead keeper assigns and supervises the work of animal keeper personnel responsible for the feeding and general care and welfare of assigned animals and exhibit areas; closely observes assigned animals; does minor or routine maintenance on exhibits and enclosures; and operates a variety of light and medium equipment. The qualified candidate is expected to have a broad base background in mammal management; however, it is also expected that the candidate may have a special interest group of animals - primates, ungulates, carnivores, etc. Salary \$31,803.00 - \$35,193.00, plus excellent benefits. Send resumé **by 30 June 1996** to: Zoological Society of San Diego, Attn: Human Resources/Mammal lead, P.O. Box 551, San Diego, CA 92112. EOE.

ZOOKEEPER...this is a zoological caretaker position working primarily large mammals (hoofstock) at Miami Metrozoo for the Parks and Recreation Department. Responsibilities include care and husbandry of a variety of large mammals on moated exhibits. Requires high school diploma or equivalency and one year's experience in the care of exotic animals, or large domestic stock. Salary entry - \$18,000.00 - Max - \$25,200.00 annually along with an excellent benefits package. Applicants need to send (2) copies of their resumé, include social security number, along with proof of education to: Alice Gilley, Zoological Supervisor, Miami Metrozoo, 12400 SW 152 Street., Miami, FL 33177.

ZOOKEEPER - Psittacines...requires minimum of one year paid, hands-on experience with Macaws and degree or equivalent zoo-related experience. **Mammals** - requires minimum of one year paid, hands-on experience with ungulates and felines and degree or equivalent zoo-related experience. Duties for both positions include daily care, feeding, habitat upkeep, breeding programs, record-keeping, medical coordination, training, acquisitions, supervising part-time staff/volunteers, and presenting educational programs, etc. Must be willing to

work weekends/holidays. Starting salary \$15,000.00 - \$20,000.00 with year-end bonus and benefits. Excellent growth potential. Salary commensurate with experience. Send resumé/ references to: Cougar Mountain Zoological Park, 19525 SE 54th, Issaquah, WA 98027. Fax (206) 392-1076. Positions open until filled.

ANIMAL KEEPER...prefer degree in biological sciences and animal care experience. Responsible for the daily care of a diverse collection, including husbandry, exhibit maintenance/design, assisting with vet procedures, and public relations. Salary \$12,500 plus benefits. Send resumé **by 30 June 1996** to: Liz Harmon, Great Plains Zoo, 805 S. Kiwanis Ave., Sioux Falls, SD 57104.

BIRD KEEPER...Tracy Aviary in Salt Lake City has one position open and is establishing a register for future positions. College course work in biology, experience in animal care, and enthusiasm for working with a diverse bird collection are required. Degree in biology or related field and two year's experience in aviculture preferred. Keepers will be involved in collection planning, exhibit renovation and design, and other aspects of animal care and management. Salary commensurate with experience and education. Please send resumé to: Scott Barton, Curator, Tracy Aviary, 589 East 1300 South, Salt Lake City, UT 84105. Closing date for the present keeper opening is **25 June 1996**; resumé may be sent in after that date to be added to the register.

SENIOR WILD ANIMAL KEEPER...requires a degree in animal science and 3+ years experience caring for mammals, birds, and/or reptiles in a zoo setting. Will be responsible for animal care and exhibit maintenance at the recently renovated Prospect Park Wildlife Center in Brooklyn, NY. Salary \$27,635.00 to start, rising to \$31,366.00 after one year. Benefits include three weeks vacation plus health, dental, and retirement plans. Send resumé with cover letter to: John Fairbairn, Human Resources, Wildlife Conservation Society, 2300 Southern Blvd., Bronx, NY 10460. (718) 220-5119. FAX (718) 220-2464.

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